Comprehensive environmental assessment and response program phase 1, installation assessment, Rocky Flats Plant

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ALBUQUERQUE OPERATIONS OFFICE ENVIRONMENT, SAFETY, AND HEALTH DIVISION ENVIRONMENTAL PROGRAMS BRANCH

COMPREHENSIVE ENVIRONMENTAL ASSESSMENT AND RESPONSE PROGRAM

PHASE 1:
INSTALLATION ASSESSMENT
ROCKY FLATS PLANT

NOT FOR PUBLIC DISSEMINATION

May contain unclaser ited controlled nuclear information subject to Section 148 of the AEA, as amended (42 USC 2168). Approval by the Department of Energy prior to release is required.

April 1986

BY _____ C ___ S20 ___ DATE ____ 10 - 28 - 94 ____

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ADMIN RECORD

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EXECUTIVE SUMMARY

NOT FOR PUBLIC DISSEMINATION May contain unclassified controlled nuclear information subject to Section 148 of the AEA, as amended (42 USC 2168). Approval by the Department of Energy prior to release as required.

The US Department of Energy (DOE) Rocky Flats Plant has been evaluated under Phase I of the Comprehensive Environmental Assessment and Response Program (CEARP) with respect to inactive waste disposal sites, accidentally contaminated sites, current waste management practices, existing and potential surface water and groundwater contamination, and compliance with applicable federal, state, and local environmental regulations. A major thrust of CEARP is to determine whether waste disposal practices followed in the past, prior to recognition of potential environmental hazards and/or the passage of environmental legislation, have resulted in environmental problems that require remedial action today. This Phase I CEARP report provides documentation for Phase I of the DOE Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Order 5480 14 and the following US Environmental Protection Agency (EPA) CERCLA preremedial activities (1) Federal Facility Site Discovery and Identification Findings (FFSDIF) (notification of newly discovered sites, including notification of negative findings), (2) Preliminary Assessment (PA), (3) Site Inspection (SI) [CEARP Preliminary SI (PSI)], and (4) Hazard Ranking System (HRS) evaluation

The Phase I CEARP report findings are based on a records search, open literature survey, interviews with Rockwell International employees, preliminary assessments, and site inspections. Therefore, the report is unavoidably subject to some uncertainty. Situations in which there is uncertainty regarding actual risk to public health and safety and to the environment will be further studied through field studies and data collection during CEARP Phase II (confirmative phase).

Potential sites identified during CEARP Phase I are presented in Tables EX-I through EX-4. As appropriate, the results for the potential sites are summarized based on a negative, positive, or uncertain finding for the following EPA CERCLA elements: (1) FFSDIF and (2) PA, SI (CEARP PSI), and HRS evaluation [including the DOE Modified HRS (MHRS)]. The HRS evaluation for the Rocky Flats Plant was conducted in two steps: (1) an overall evaluation (two aggregate scores) of the risk of the plant relative to other National Priorities List (NPL) sites; and (2) an evaluation of eleven individual sites within plant boundaries to determine relative hazards. The two aggregated scores for the overall evaluation were based on two separate surface water drainages with different public receptors. The scores are summarized in Table EX-5. Both aggregated drainages

Rocky Fints Plant CEARP Phase 1 DRAFT April 1986

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and three of the individual sites received scores exceeding the 28.5 threshold value for inclusion on the NPL

In addition, some of the sites do or possibly could exceed DOE remedial action criteria/guidelines and/or potentially could pose regulatory concerns and are recommended for future action. Thirty-one sites have been recommended for further evaluation under the continued CEARP Phase I Installation Assessment, fourteen sites have been recommended for CEARP Phase II Confirmation, one site is currently into CEARP Phase IV Remedial Action, and twenty-one sites are currently into CEARP Phase V Compliance and Verification. Rockwell International has or is currently conducting site characterization activities and remedial action at several sites.

Compliance with appropriate environmental statutes at the Rocky Flats Plant has been evaluated. The areas identified in Phase I for further evaluation are (1) the underlying aquifer, to further characterize the extent and movement of the volatile organic compounds (VOCs) plume, (2) inactive disposal sites (or inactive portions of active disposal sites) and contaminated sites to determine the potential availability of hazardous substances to be released to the environment, (3) the management jurisdiction of radioactive/hazardous chemical mixed waste between DOE, EPA, and the State of Colorado; (4) the feasibility of segregating RCRA-regulated waste from byproduct material and/or from candidate mixed waste, (5) a method of disposal for noncombustible, radioactive, PCB-contaminated materials; (6) emissions of VOCs to the atmosphere; (7) sites that might be historic located within the plant boundaries; (8) seeps and springs areas for potential wetland impacts, and (9) hydrological monitoring programs, to ensure their capability to detect hazardous substances in ground and/or surface water

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		Table EX 1. Poter uith Pot	wist CERCLA Isible Radio	1. Potential CENCIA Sites Identified Buring CEANS with Possible Radioactive Waste of Contamination	Table EN 1. Potential CERCLA Sites Identified During CEARP Phase ; with Possible Radioactive Waste of Centamination	
		200	DOE CEARP Phase I	- 1		Planned future Action
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3116	21014	Firefine	203	2283	Crostas Element	CEARP/CERCIAS Order Phase
Red Soil Buriel (300 Area)		7	1	3	1	Compliance and Verification (Phase V)
And Site (400 Area)	Inactive/ Cleaned	1	1	1	į	Compliance and Verification (Phase V)
Red Sites (2) (500 Area)	Inactiva/ Cleaned	ī	ž	1	Mens	Compliance and Verification (Phase V)
And Sites (2) (600 Arms)	Inactive/ Cleaned	ī	1	1	Hora	Campliance and Verification (Phase V)
Red Sites (4) (700 Aren)						
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E 03	Inactive	ž	ş	1	3	Compliance and Verification (Phase V)
3100 4	Inactive	Positive	¥	¥	ž.	Installation Assessment (Phose 1, Bupplemental)
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510-1	Inactive/ Covered	Positive	R	•	20	Confirmation (Phase 11)

Rocky Flats Plant CEARP Phase 1 DRAFT April 1986

Executive Summary, Page EX-3

Table EX.1. Petential CERCLA Sites Identified During CEASP Phase I with Possible Redioactive Wests or Contemination (con.)

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nt and Response Pregram/Comprehensive Environmental Response, Compensation, and Limbility Act By securd heating System/DOE modified Securd Sarking System Comprehensive Environmental Assess Let Applicable

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Executive Summery, Page EX-4

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	Cooting Towar Ports (488 Area)	inective/ Covered	Paltin	2	¥	i	Continuitien (Phase 11)

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Table EX.2. Potential CERCLA Bites Identified Buring CEARP Phase I with Possible Redisactive/Retardous Chemical Vests or Centemination (con.)

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963 Brus Storage Area (908 Area)	Inscrive/ Closes	Positiva	*	l _	None Company	Confirmation (Phase 11)
Neural Area (900 Area)	Institut	Pasitiva	¥	w	eg e	Installation Assessment
Out-of-Service Precess beste Tarks (700 Area)	Inective	Pealtive	¥	¥	i	(Pass I, Supplemental) Installation Assessment (Pass I, Supplemental)
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Radioactive Liquid Mate Storage Tanks (780 Area)	.	Paritiva	¥	¥	i	Installation Assessment (Place I, Supplemental)
bolding Tanks (700 Area)	Ĭ	Pesitive	¥	¥	i	Installation Assessment
Valve Vaude 7 (708 Arms)	Ī	Positive	¥	¥	i	(Pleas I, Supplemental) Installation Assessment
Some Line Great (700 Arms)		Pultive	¥	¥	i	(Place I, Eugelomental) Installation Assessment
Andlemetive Liquid Lauts (8) (700 Area)	•	í	1	1	for	(Phone I, Bappiemental) Compliance and Verification (Phone V)

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NOTICE:

INCOMPLETE DOCUMENT

The following document is missing pages EX-7 an EX-8 (DO44571-DO44572). This document was distributed in an incomplete state, and the microform copy is representative of the paper copy. If replacement pages are distributed, they will be microfilmed and included in the Administrative Record file.

		98	POS CEARP Phone I			Planned future Areins
		FFS01F/PA/PS1	e S	g Sweet	EPA CERCIA	000
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Cooling Tower Blondown (300 Area)	Inective	Positive	¥	*	Mone	Installation Assessment (Phose I, Supplemental)
Cooling Teaer Bloudoun (700 Area)	Insective	Positive	¥	¥	Š	Installation Assessment (Phase 1, Supplemental)
Hilleide Oil Leek (808 Area)	ij	Postrive	¥	ĭ	8	Installation Assessment (Phase 1, Supplemental)
Oil Leak (400 Area)	3	Pasitiva	¥	1	e	Installation Assessment (Phase 1, Supplemental)
Oil Sludge Pit (800 Arms)	Inactive/ Covered	Positive	•	1	Mone	Confirmation (Phose 11)
fuel Oil Loak (300 Area)	1	£	£	1	8	Compliance and Verification (Phase V)
fuel Off Tank (460 Area)	.	¥	\$	1	8 0	Compliance and Verification (Phase V)
Lithium Hotel Destruction Site (300 Arms)	Inective/ Built Dear	Pairiw	•	ŧ	i	Confirmation (Phase II)
Reactive Metal Destruction Site (900 Area)	Inactiva/ Ceverad	Pesitiva	2	•	1	Confirmation (Phase 11)
Chemical Storage (500 Area)	Inective	Pasitive	¥	£	ŧ	Installation Assessment (Phoce I, Supplemental)

		Table EN 3. Potential CENCLA Sites Identified During CEARP Phase ; with Possible Henradiosative Natardaus Chamical Maste or Centenination (con.)	ciel CERCLA Hilive Helen	Sites Identified data Chemical Medi	Table EN 3. Potantial CERCLA Sites Identified Buring CEARP Phase I Possible Henradiosofive Natandous Chemical Maste or Centanination (co	~
		30 304	POE CEANY Phase I			Plemed future Action
710		ff 30 IF /PA/PSI	a Si	HIMS P	BPA CERCLA	300
2114	Kethe	Finding	Kore	SCOTE	Program Element	CEMP/CERCIA ^C Order Phone
fiberglassing Sites (2) (600 Area)	Inactive	Positive	¥	1	ero#	Installation Assessment (Phase I, Supplemental)
Liquid Dumping (800 Area)	Institu	Positive	¥	¥	Hore	Installation Assessment (Phase I, Supplemental)
Chemical Burial (800 Area)	Inective/ Covered	Positive	¥	£	litora	Installation Assessment (Mese I, Supplemental)
Outfall (808 Area)	Inective	Positive	¥	1	5	Installation Assessment (Mose 1, Supplemental)
Out of Berylca Fuel Tanks (800 Area)	Inactiva/ Fitted	Pasitive	¥	\$	Bone	Installation Assessment (Phase I, Supplemental)
Acid Lasks (2) (400 Ares)	Ī	Hegative	ī	s	Kore	Blone
Acid Leak (300 Area)	ij	Megative	\$	£	Bore	Hone
Multiple Acid Spills (800 Area)	1110	30	1	í	i	e e e e e e e e e e e e e e e e e e e
Countic/ Acid Spills (700 Area)	1110	Pealtive	¥	*	Bors	Installation Assessment (Phose I, Supplemental)
Caustic Leak (400 Area)	3	Regative	£	1	<u> </u>	None

NOTICE:

INCOMPLETE DOCUMENT

The following document is missing page EX-11 (DO44575). This document was distributed in an incomplete state, and the microform copy is representative of the paper copy. If replacement pages are distributed, they will be microfilmed and included in the Administrative Record file.

Imble EX.3. Petancial CERCLA Sites Identified Buring CEASP Phase I with Possible Henradioactive Naterdous Chemical Weste or Contamination (can)

Plarned Future Action DOE GARP/GRCLA Order Phase	Confirmation (Phase 11)	
EPA GENCIA Propriet Element	Remedial Irvestigation	
GAR There I mush marsh Score Score	1	
Frank Payer Phase I	Pesitive	
Siste	VOCs in Leak Croundater	

Comprehensive Environmental Assessment and Response Program/Comprehensive Environmental Response, Compensation, and Liability Act . Federal facility Sita Discovery and Identification Findings/Proliminary Assessments/Proliminary Sita Impactions BPA Hotord Apriling System/DOE Hodified Hotord Ranking System Mot Evoluated

"Net Applicable

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Table Ex.6. Petential CERCIA Sites Identified During CEARP Phase I et Offsite Lecations

		200	-			Planned Future Action
lite	Status	FESDIF/PA/PSI ms Mans Mans Febra Rence	2 S S S S S S S S S S S S S S S S S S S	2 E E E	EPA CENCIA PESECAR ÉLMENT	DOE CEARP/CENCIA ^E Order Phase
Land Surface Contamination	Inactive	**	1	1	More	Compilance and Verification (Phase V)
Great Meatern Reservoir	Inactive	1	á	1	· ·	Compliance and Verification (Phase V)
Standley Lake	smet ive	1	1	1	ec.	Compliance and Verification (Phase V)
House Reservoir	inactive	í	ı	1	£ .	Compliance and Verification (Phase V)

federal facility site Discovery and Identification findings/freliminary Assessments/Freliminary Site Impactions

^bEpa mazard Ranking System/DDE Hedified Mazard Renking System ^CComprehensive Environmental Assessment and Response Program/Comprehensive Environmental Asspense, Compensation, and Liability Act ^Mhot Applicable

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Table EX 5 Hazard Ranking Summary

Site	Total Migration Mode		Direct Contact Score		Fire/ Explosion Score	
	Chem	Rad	Chem	Rad	Chem	Rad
Aggregated						
Walnut Creek Woman Creek	53 40	9 6	17 0	0	0	0
Individual Sites						
Solar Evaporation Ponds	46	7	17	0	0	0
VOC in Groundwater	40	NA ²	0	NA	0	NA
Present Landfill	34	5	0	0	0	0
903 Drum Storage Area	26	1	0	0	0	0
Radioactive Site 800 Area	20	0	0	0	0	0
Trenches T-1 to T-11	17	6	0	0	0	0
Reactive Metal Destruction Site	16	NA	0	NA	0	NA
Original Landfill	15	5	0	0	0	0
Cooling Tower Blowdown Ponds	12	NEb	0	NE	0	NE
Oil Sludge Disposal	9	NA	0	NA	0	NA
Lithium Metal Destruction Site	8	NA	0	NA	0	NA

a Not applicable

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b Not evaluated

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I INTRODUCTION

I.A. Background

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US Department of Energy (DOE) facilities operate under a policy of full compliance with applicable environmental regulations while conducting their missions. The DOE Albuquerque Operations Office (AL) initiated the Comprehensive Environmental Assessment and Response Program (CEARP) in mid-1984 to help fulfill that commitment at installations within the AL complex. CEARP will also assist DOE in setting environmental priorities and will help provide justification for funding to carry out enhancements of existing programs or remedial actions where required. Implementation of CEARP will be realized by combined forces of AL, individual DOE area offices, DOE prime contractors, Los Alamos National Laboratory, and other assistance as found to be necessary.

I.B. Authority

Authority to implement CEARP is primarily derived from the following DOE and AL orders:

- Comprehensive Environmental Response, Compensation, and Liability
 Act Program (DOE 5480 14)
- Hazardous, Toxic, and Radioactive Mixed Waste Management (DOE 5480 2 and AL 5480 2)
- Prevention, Control, and Abatement of Environmental Pollution (Ch. XII of DOE 5480.1 and AL 54801)
- Environmental Protection, Safety, and Health Protection Information Reporting Requirements (DOE 5484 1 and AL 5484.1)
- Implementation of the National Environmental Policy Act (DOE 5440 IC and AL 5440 IB)

Federal and state regulations with particular importance to Rockwell International (RI) operations at Rocky Flats Plant are discussed in Sec. IV.

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I.C. Purpose and Scope

CEARP is a phased program to identify, assess, and correct existing or potential environmental problems. The review covers major environmental regulations such as the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Resource Conservation and Recovery Act (RCRA), National Environmental Policy Act (NEPA), Clean Air Act (CAA), Clean Water Act (CWA), Safe Drinking Water Act (SDWA), Toxic Substances Control Act (TSCA), and the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), with emphasis on CERCLA and RCRA. Past, current, and future practices to handle and dispose of hazardous substances, defined under CERCLA, are evaluated. In addition, environmental pollution control requirements and environmental monitoring programs for hazardous substances are evaluated for both adequate understanding of pathways and regulatory compliance.

I.D. Methodology

CEARP is being implemented in five phases, which exactly parallel DOE Order 5480 14. Additionally, the U.S. Environmental Protection Agency (EPA) has prepared guidance for federal facilities to carry out their responsibilities under CERCLA. The EPA has outlined its plans and intentions in a series of program elements that are organized in a somewhat different fashion but constitute the same basic approach as CEARP (Federal Facilities Program Manual for Implementing CERCLA Responsibilities of Federal Agencies, final draft). The five CEARP phases are linked as indicated in Fig. I.1. CEARP includes a review of major federal environmental regulations. The review serves two primary purposes: (1) determines compliance with environmental regulations and (2) evaluates the interaction of CERCLA with other environmental regulations, for example, releases permitted under the CWA or CAA, and releases exceeding reportable quantities under CERCLA, or RCRA-related remedial activities and CERCLA-related remedial activities. The purposes of individual CEARP phases are as follows.

I.D.I. Phase I - Assessment of the Installation. Phase I objectives are to determine present compliance with environmental laws and to ascertain the magnitude of potential environmental concerns. Where insufficient data exist to accomplish this, the additional information necessary to complete the evaluation will be identified. The CEARP Phase I report will provide documentation for Phase I of the DOE CERCLA

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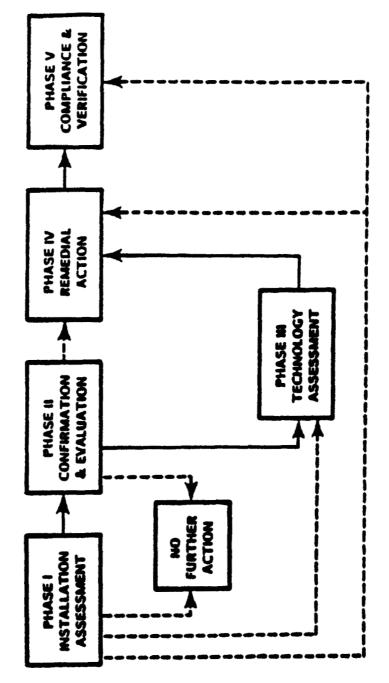


Figure 1.1. CEARP Decision Flow Chart.

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Order and for the following EPA CERCLA preremedial activities (1) Federal Facility Site Discovery and Identification Findings (FFSDIF)--notification of newly discovered sites, including notification of negative findings, (2) Preliminary Assessment (PA) (3) Site Inspection (SI), and (4) Hazard Ranking System (HRS) evaluation (see I E & the Hazard Ranking System). Sites at Rocky Flats Plant are recommended for no further action when CEARP findings indicate (1) negative findings for the CERCLA FFSDIF process (e.g., potential sites that are found not to exist or spills that were removed in the past through remedial action), or (2) sites initially requiring notification for the FFSDIF process that are later found to pose no threat of release under CEARP for the EPA CERCLA PA process (e.g., potential sites where the hazardous substance initially identified, because of its stability, no longer persists in the environment). Consequently, sites at Rocky Flats Plant that no longer pose a threat of release are not included in the EPA HRS and DOE Modified HRS (MHRS). This procedure is consistent with guidance provided to federal facilities by EPA (Federal Facility Program Manual for Implementing CERCLA Responsibilities of Federal Agencies, final draft). (See Fig 12)

Sites requiring HRS evaluation are scored as follows: (1) nonradioactive sites are scored with the EPA HRS and (2) radioactive sites are scored with the EPA HRS and the DOE MHRS. Sites meeting EPA criteria to be listed on the National Priorities List (NPL) are recommended for future action under DOE CERCLA Phase II to quantify the potential migration problem. DOE CERCLA Phase II activities are consistent with EPA CERCLA Sites that do not meet EPA criteria to be listed on the NPL but exceed other applicable DOE remedial action criteria/guidelines (e.g., guidelines for the DOE Surplus Facilities Management Program) and/or sites posing potential regulatory compliance concerns (e.g., RCRA-related remedial activities) are recommended for future action under CEARP. No further action is recommended for those sites not meeting these criteria

I.D.2. Phase II - Confirmation Phase II objectives are to (1) obtain additional information identified as necessary during Phase I, (2) complete an environmental evaluation to confirm the presence or absence of potential environmental problems identified in Phase I, and (3) plan and carry out measurement and sampling programs as required to understand potential sources of contaminants and potential environmental pathways.

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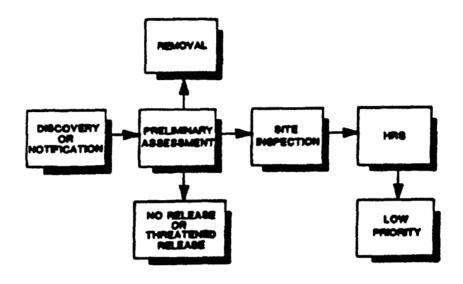


Figure 12. Initial Phases of Federal Agency-Lead Superfund Response Activities and Events.

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Confirmed problems will be assessed for health or environmental risk as a basis for setting priorities for remedial or other follow-up actions. CEARP Phase II will provide documentation for Phase II of the DOE CERCLA Order (Phase IIA Monitoring Plan and IIB Site Characterization) and for two EPA CERCLA remedial planning program elements (Remedial Investigation Sampling Plan and Remedial Investigation)

LD.3. Phase III - Technological Assessment Phase III objectives are to develop plans for remedial actions or enhancements of existing programs by proposing and assessing alternative technologies and approaches to eliminate or control environmental problems identified as needing correction in CEARP Phase II. The evaluation will include assessing the effectiveness of technology; impacts on health, safety, and the environment, and cost-benefit analysis where appropriate. This process will include identifying or developing appropriate criteria and performing any evaluation of environmental impact required by the NEPA. CEARP Phase III reports will provide documentation for Phase III of the DOE CERCL. Order and for two remedial planning program elements of EPA CERCLA (Feasibility Study and Remedial Action Selection).

I.D.4. Phase IV - Remedial Action. Phase IV objectives are to implement the recommended site-specific remedial measures identified in Phase III, which could include engineering design and construction to remedy or control environmental problems CEARP Phase IV will encompass requirements of the DOE CERCLA Order (Phase IV) and the remedial implementation program elements of EPA CERCLA (Design and Action)

LD.5. Phase V - Compliance and Verification. Phase V objectives are to (1) verify and document the adequacy of remedial actions carried out in Phase IV, and (2) identify and plan for any continuing monitoring requirements needed to demonstrate control of migration or adequately recognize future problems. CEARP Phase V will encompass requirements of the DOE CERCLA Order Phase V and EPA CERCLA final site inspection/closeout and monitoring.

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I.E. Phase I Implementation

CEARP Phase I was carried out at Rocky Flats Plant as a number of tasks. These tasks were performed by personnel of the Los Alamos National Laboratory Environmental Surveillance Group and Rockwell International (Rocky Flats Plant operating contractor)

LE.I. Records Search and Literature Survey During the Rocky Flats Plant records search and open literature survey, existing documents in the following categories were reviewed and evaluated by Los Alamos personnel

- environmental documents
- · development or management plans
- environmental monitoring reports
- federal/state/local permits
- operational records/documents
- safety analysis documents

- standard operating procedures
- appraisals, audits, inspections
- contingency/emergency plans
- special/topical studies or reports
- history and mission documents
- accident/incident investigation reports

Information acquired during the records search and literature survey that is directly related to CEARP is included and referenced as appropriate in this CEARP Phase I report. A listing of documents surveyed during the review process is provided in Appendix C. This listing is representative of documents reviewed. In addition, the appropriate CEARP-related Rocky Flats Plant internal files were reviewed. Appropriate AL CEARP-related files for Rocky Flats Plant were also reviewed.

LE2. Employee Interviews. Rockwell International employees (former and current) identified as possibly having knowledge relevant to CEARP were screened to determine who would be interviewed. More than 30 Rockwell International employees familiar with or having responsibility for former and current management practices for hazardous substances, facility operations (e.g., processes that generated solid and liquid hazardous substances), or who might know about past leaks or spills of hazardous substances were identified during the screening process. These individuals were interviewed during the official review process to identify undocumented incidents or management practices that could have resulted in environmental concerns. Information from the interview process covers the complete history of Rockwell International at the Rocky Flats Plant. Those interviewed included 1 employee, 1951-1952; 2 employees, 1952-1955; 13 employees, 1955-1960; 21 employees, 1960-1970; 24 employees 1970-1980, 23 employees 1980-

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Current and past professionals in Operational Safety at Rocky Flats Plant (Technical Services, Industrial Hygiene, Health Physics, and Environment) were interviewed as well as those in Production, Product and Process Development, Engineering, Facilities Engineering, and Technology Application and Development. A three-person team from Los Alamos National Laboratory conducted the interviews during the week of Sept 17, 1984. The interview notes were compiled and returned to the person interviewed to verify for accuracy. The information from the interview process is included (as appropriate) in this CEARP Phase I report. However, names, positions, and period of position performance have been omitted to preserve anonymity and ensure compliance with employee protection requirements of CERCLA (Section 110 of CERCLA)

Information collected represents individual recollections of events and conditions over an extended period of time, some of it as far back as three decades. This information was accepted at face value as an indicator of potential environmental concerns but cannot be taken as documented proof of environmental perturbations. However, any event or condition mentioned that had and/or has significant potential to release hazardous substances into the environment provided the basis for a recommendation that at least some confirmatory data be collected under CEARP Phase II. This approach ensures that suspect sites are characterized and that potential sources for release of hazardous substances are not overlooked. The intent is to have definitive documentation by the end of CEARP Phase II confirming the presence or absence of any environmental concerns

- I.E.3. Evaluation of Waste Management. Present and past management practices for hazardous substances were reviewed and evaluated. Information for this process was gathered during the CEARP records search and literature survey, employee interviews, and investigation of current operations at the Rocky Flats Plant.
- LE.4. Identification of Contaminated Areas. Sites that have been contaminated or are suspected of being contaminated as a result of current or former practices, including leaks and spills, were identified. Information for this process was gathered during the CEARP records search and literature survey, employee interviews, and investigation of current operations at the Rocky Flats Plant.
- I.E.S. Evaluation of Compliance with Environmental Regulations. An evaluation of compliance with applicable environmental standards and regulations, including

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DOE orders and internal guidelines, was conducted. Special emphasis was placed on those regulations that interact with CERCLA (e.g., permitted releases under the CWA or CAA and exceeding reportable quantities under CERCLA).

LE.6. Preliminary Physical Survey A preliminary physical survey of portions of Rocky Flats Plant was conducted to validate observations from the CEARP document search and interviews and to identify any other signs of environmental stress or facility features that might indicate a potential for contamination

I.E.7. Pathway Evaluation A preliminary evaluation of potential migration pathways for hazardous substances was made

LES. The Hazard Ranking System (HRS) The HRS is used by EPA to establish a National Priorities List of facilities for initial attention under CERCLA. Effective Feb 18, 1986, federal sites meeting criteria to be listed on the NPL can be listed there.

The EPA HRS, however, does not discriminate among different radioisotopes relative to their potential risk at potential CERCLA sites. Therefore, DOE developed the MHRS, which is a conceptually minor modification/addition to the HRS. The MHRS permits a better assessment of existing radiological risks. Therefore, potentially radioactive sites are scored with DOE's MHRS and EPA's HRS, nonradioactive sites requiring evaluation are scored with EPA's HRS.

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II DESCRIPTION OF THE ROCKY FLATS PLANT

Rocky Flats Plant is a government-owned, contractor-operated (GOCO) facility Dow Chemical Company was the prime operating contractor for the Atomic Energy Commission (AEC), which was succeeded by the Energy Research and Development Administration (ERDA) and then by the Department of Energy (DOE). The North American Space Operations, Rockwell International, succeeded Dow Chemical Company as the prime contractor for DOE on July 1, 1975.

In addition to the plant, three satellite facilities are maintained by Rockwell International as part of the plant's operations. Two are leased facilities nearby (the Lake Arbor facility and the Broomfield facility) and one is located in Oxnard, Ca. (Precision Forge). Lake Arbor houses engineering operations, a machine shop, purchasing departments, and office areas. Broomfield houses a pipe fabrication and cleaning operation, a warehouse operation, and office areas. Precision Forge, recently acquired by DOE and turned over to Rockwell International for operation, houses a high velocity forging operation that makes stainless steel components for the plant and for other contractors in the DOE nuclear weapons complex.

II.A. Location and Physical Characteristics

Rocky Flats Plant is located in northern Jefferson County. Co. approximately 16 air miles northwest of Denver. The plant covers almost 11 mi² (approximately 6,550 acres), and occupies sections 1 through 4 and 9 through 15, of R70W,T2S, Jefferson County. The plant is centered at 105° 11' 30" west longitude and 39° 53' 30" north latitude.

To the north is Colorado State Highway 128; to the east is Jefferson County Highway 17, also known as Indiana Street, to the south is Colorado State Highway 72, and to the west is Colorado State Highway 93. Access is from either an east access road exiting from Jefferson County Highway 17 or a west access road exiting from Highway 93 Within 9 to 12 mi are the communities of Broomfield, Arvada, Golden, and Boulder Figure II I shows the general location of the plant.

The US Government approved construction of the plant in 1951 as an addition to the nation's nuclear weapons production complex Limited operations began in 1952

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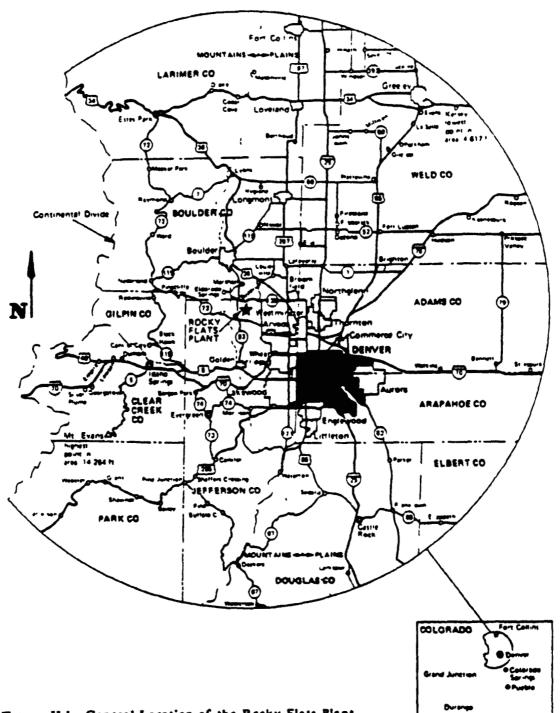


Figure II.1. General Location of the Rocky Flats Plant.

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within a site area of 2,520 acres. All buildings were constructed within a controlled area of less than 400 acres, and involved 700,000 $\rm ft^2$ of building floor space in 20 structures. Over the years, additional structures were built and today there are more than 100 buildings with a combined floor space of more than 2.1 million $\rm ft^2$

The plant was enlarged to its present size of approximately 6,550 acres by adding a buffer zone in 1974-1975 (Fig. II.2). The buffer zone was used by its former owners for grazing cattle and horses. It is enclosed within a cattle fence and is posted with signs indicating restricted access. Within this buffer zone are firebreaks, holding ponds on three water courses, environmental monitoring stations, a sanitary landfill, power lines, gravel pits, target ranges, access roads, and a wind energy test facility. The wind energy test facility is not part of the defense program operations at the plant, and it is not evaluated as part of this study.

Most of the operations at Rocky Flats Plant are performed within the security-fenced area shown in the center of Fig. II.2 Figure II.3 is an enlargement of this area, showing the eight major subdivisions based on building numbers used in this report.

II.B. Mission

Rocky Flats Plant's primary mission is to produce plutonium and other metal components for nuclear weapons. Key production activities involve fabrication of plutonium, uranium, and nonradioactive metals (principally beryllium and stainless steel) Parts made at the plant are shipped elsewhere for assembly. When a nuclear weapon is determined to be obsolete, components fabricated at the plant are returned to it for special processing to recover plutonium and americium. The plant has specialized facilities and equipment for handling these materials, as well as personnel with extensive knowledge in the chemistry and fabrication of plutonium, beryllium, and other materials that require special handling.

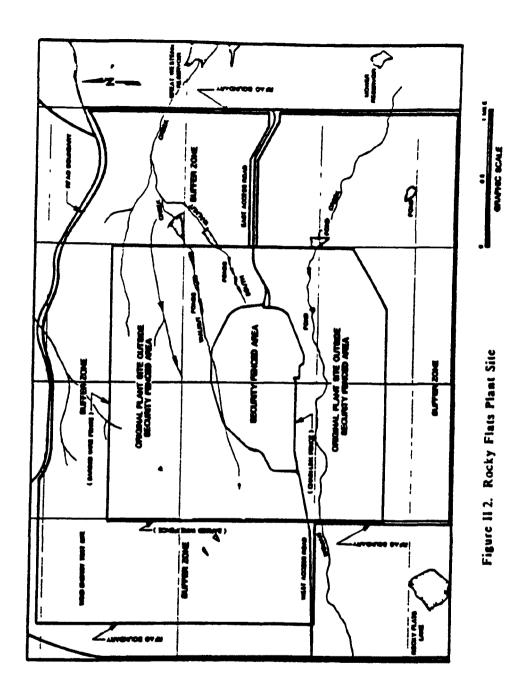
II.C. Demographics

Approximately 50% of the area within 10 mi of the plant is in Jefferson County, the remainder is divided between Boulder County (40%) and Adams County (10%) According to the 1973 Colorado Land Use Map, 75% of this land was unused or was used for agriculture. Since that time, portions of this land have been converted to housing, and today, several new housing subdivisions are being started within a few miles of the

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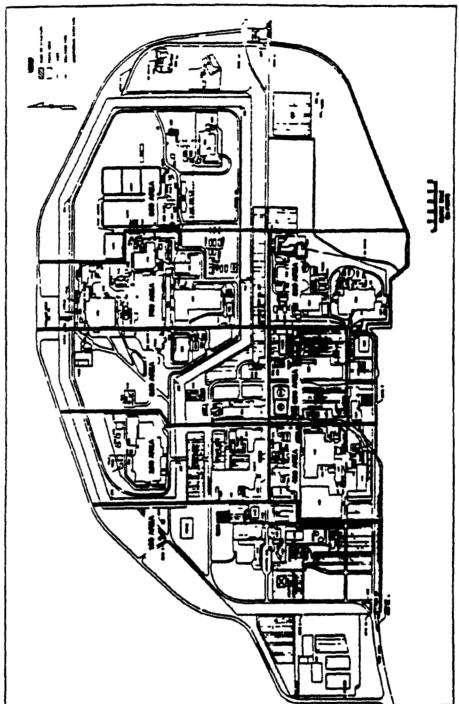
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buffer zone (One is located south of the Jefferson County Airport, and several are located southeast of the plant)

A demographic study, based on 1980 census data (AEMR 1985), shows that the 1980 population living within 50 mi of the plant was approximately 18 million people, with a projected increase to 3.5 million by the year 2000. Within 5 mi of the plant were about 9,500 people, with projected increases to about 20,000 people by the year 2000. The most populous sector was to the southeast, toward the center of Denver. This sector (between 10 and 50 mi of the plant) had a 1980 population of about 555,000 people with projected increases to 1,500,000 by the year 2000.

II.D. Important Site Characteristics

Rocky Flats Plant is located near large urbanized areas making accidental releases of hazardous substances, pass and current, a sensitive issue to the immediate population Past releases of radioisotopes at Rocky Flats Plant have been made public by Rockwell International and there has been routine annual reporting of environmental information Public reaction to these announcements has become increasingly adverse with the continued growth of the urbanized areas and the antinuclear movement. The plutonium releases have resulted in extensive monitoring and cleanup efforts, but also in litigation against the plant for negative impacts offsite.

The local hydrology is controlled by a thin gravelly alluvium that is very permeable. Surface and groundwater flow is from west to east, originating in the Front Range. Groundwater is known to surface at seeps and springs within the natural streams traversing the site and flowing to Great Western Reservoir or to Standley Lake. Both of these bodies of water serve as drinking water supplies for nearby population centers. Recently detected volatile organic compounds (VOCs) in the shallow aquifer at Rocky Flats Plant have caused additional adverse public reaction to its operations. This topic is discussed in Section IV and Section V

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III ENVIRONMENTAL SUMMARY

The area surrounding the Rocky Flats Plant is primarily agricultural or currently undeveloped. Its environs are influenced by the Front Range of the Rocky Mountains immediately to the west and by the location of the plant at 6,000 ft above sea level. The surficial geology is best described by the name 'rocky flats'. The plant is located on the eastern edge of a geological bench, about 5 mi wide in an east-west direction, flanking the foothills of the Front Range. The stony soil was formed by alluvial outwash from the mountains. This deposit consists largely of gravel and cobbles intermixed with sand and clay. Low precipitation, drying winds, and a permeable gravel substrate contribute to the arid environment, which is reflected by short-grass prairie vegetation found growing on this geological bench.

III A. Meteorology

The area surrounding Rocky Flats Plant has a semiarid climate characteristic of much of the central Rocky Mountain region. Temperatures are moderate, extremely warm or cold weather is usually of short duration. On the average, daily summer temperatures range from 55°F to 85°F and winter temperatures range from 20°F to 45°F. Low average relative humidity (46%), due to the blocking effect of the Rocky Mountains, produces a very comfortable climate.

Forty percent of the 15-in annual precipitation falls during the spring season, much of it as wet snow. Thunderstorms (June to August) account for an additional 30% of the annual precipitation. Autumn and winter are drier seasons, accounting for 19 and 11% of the annual precipitation, respectively. Snowfall averages 85 in/yr, falling from October through May

Because of its location, 4 mi east of the foothills of the Continental Divide, the area experiences Chinook winds with gusts occasionally exceeding 100 mi/h. The recurrence period for high winds and winds associated with tornadoes has been analyzed; the 100-yr return-period wind speed is 103 mi/h and the one million year return-period wind speed is 168 mi/h (Coates 1984)

Special attention has been focused on dispersion meteorology surrounding Rocky Flats Plant due to the remote possibility that significant atmospheric releases might affect

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the Denver metropolitan area. Studies of airflow and dispersion characteristics are available (Crow 1974, Hodgin 1984).

The studies by Crow indicate that drainage flows (winds coming down off the mountains to the west) turn and move toward the north and northeast along the South Platte River Valley to the west and north of Brighton, Co. These drainage flows are of particular interest because they occur under stable atmospheric dispersion conditions (generally at night) when atmospheric mixing is limited. Thus a release to the atmosphere under "worst case" dispersion conditions would not be expected to move directly over Denver

III.B. Geology

Rocky Flats Plant is located on a broad, eastward sloping plain of overlapping alluvial fans developed along the Front Range of the Rocky Mountains. These fans extend about 5 mi in an east-west direction originating on the west in the abruptly rising Front Range and terminating on the east at a break in slope to low rolling hills. The Continental Divide is about 26 mi west of the plant.

At Rocky Flats Plant, more than 12,000 ft of sedimentary rock formations overlie the Precambrian crystalline basement rock. The following brief geological description is presented for the upper 1,200 ft of these formations. A detailed description of the geology, structure, and stratigraphy are found in the following references. Dames and Moore 1981, Lovering 1932, Malde 1955, Robson 1981, Scott 1963, 1965, and 1972, Spencer 1961, DOE 1981, and Van Horn 1972. A map showing the surficial geology surrounding the plant is shown in Fig. III I.

The upper 1,200 ft of sedimentary rock formations in ascending order are the Fox Hills Sandstone, the Laramie Formation, the Arapahoe Formation, the Rocky Flats Alluvium, and colluvium on walls of the valleys or alluvium in stream channels within the valleys. The Fox Hills Sandstone is a marine deposit of sandy shale grading up into a massive sandstone. The thickness usually ranges from 35 to 100 ft. Figure III.2 illustrates the geologic cross-section in the area surrounding the plant.

The Fox Hills Sandstone is overlain by the Laramie Formation. The Laramie Formation is a continental deposit divided into two units. a lower sandstone unit and an upper shale unit. The sandstone unit is about 90 ft thick overlain by the shale unit,

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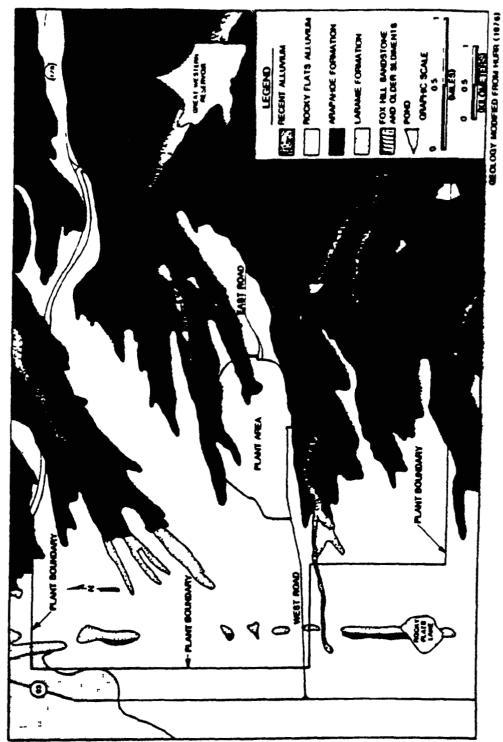


Figure III I Surficial Geology Map of the Area Surrounding Rocky Flets Plant

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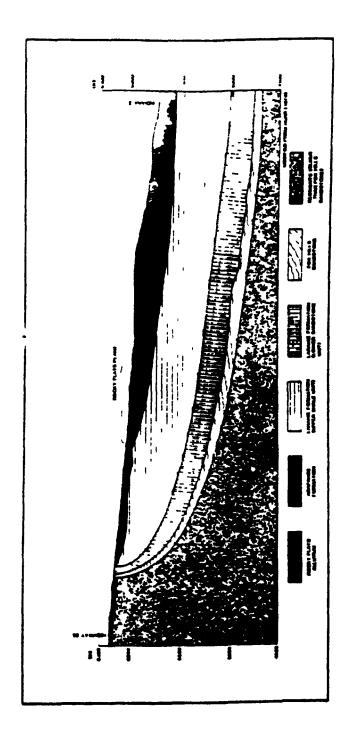


Figure III 2. Generalized Geologic Cross-Section Showing Geologic Units Beneath the Plant

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which is about 320 ft thick. The lower sandstone unit and the Fox Hills Sandstone are collectively referred to as the Laramie Fox Hills aquifer.

The Laramie Formation is overlain by the Arapahoe Formation, a continental deposit of claystone with thin lenses of sandstone The thickness is about 270 ft at Rocky Flats Plant. The valleys north, east, and south of the plant are cut into and expose portions of the Arapahoe Formation.

The Arapahoe Formation is overlain by the Rocky Flats Alluvium, a series of coalescing alluvial fans deposited as outwash from the Front Range. The alluvium consists of a chaotic deposit of gravels and boulders in a mixture of clay, silt, and sand. The alluvium was deposited on an erosional surface of the Arapahoe Formation, thus the thickness varies, ranging up to 50 ft. A clay loam soil has developed in the upper surface of the alluvium. In places the soil contains some calcium carbonate (caliche) layers. The Rocky Flats Alluvium contains a shallow body of groundwater, which can locally perch on the Arapahoe Formation. The closeness of this perched aquifer to the surface of the ground allows it to strongly influence the local hydrology.

Colluvium on the valley's slopes has formed from mass wasting of the Rocky Flats Alluvium and claystone of the Arapahoe Formation. The colluvium is usually quite thin, resting on the claystone and lenticular sands of the Arapahoe Formation. Landslides in the colluvium or creep of the colluvium occur on the valley's slopes because of the angle of the contact with the Arapahoe Formation and lubrication along the contact by water infiltrating the colluvium. This phenomenon is important to Rocky Flats Plant because of the potential for landslides to damage retention ponds and diversion ditches. Thin sections of alluvium are formed by erosion and by deposition in the stream channels in the valley.

III.C. Hydrology

The major part of this section on hydrology is taken from Blume 1972, Hurr 1976, RFEIS 1980, Robson 1981, and AEMR 1983.

Rocky Flats Plant's operational area is located on the eastern margin of a geologic bench between two stream cut valleys: North Walnut Creek and Woman Creek. Baseflow in the creeks is caused by a combination of precipitation and discharge of groundwater. South Walnut Creek originates immediately east of the operational area. North and South

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Walnut Creeks join prior to draining into Great Western Reservoir, which provides water for the community of Broomfield Woman Creek, southeast of the plant, drains into Standley Lake, which provides water to Westminster, Thornton, and Northglenn Most water entering these reservoirs is from ditches that divert runoff from Front Range creeks. Church Ditch, McKay Ditch, Smart Ditch, South Boulder Division Canal, and Kinnear Ditch and Reservoir Company Ditch traverse the plant, conveying water from the Front Range to offsite lakes and reservoirs east of the plant. Runoff from the plant's operational area is retained in onsite ponds and released after satisfying compliance with the appropriate Colorado Department of Health Standards and EPA NPDES permit conditions.

III.C.1. Surface Water Three intermittent streams drain the plant: Rock Creek drains the northwest corner, Woman Creek drains the southern third, and North and South Walnut Creeks drain the remainder. No naturally occurring ponds or lakes are within plant boundaries. Interceptor ditches have been constructed to collect and divert all runoff from the plant's operational areas.

III.C.1.a. Walnut Creek. Walnut Creek (North and South Walnut branches) is a small, intermittent stream. North Walnut Creek flows to the north of the plant and has a drainage area of about 12 mi² within the boundaries of the plant. South Walnut Creek originates within the plant and has a drainage area of about 0.46 mi² (Fig. III.3). North Walnut Creek and South Walnut Creek join together onsite about 0.5 mi west of Indiana Avenue (eastern plant boundary). From that point, Walnut Creek flows southeast into Great Western Reservoir. However, most of the water in Great Western Reservoir comes from Church Ditch, which conveys water from Clear Creek.

The plant has maintained as close to zero discharge as possible to Walnut Creek same 1979. To accomplish this, several steps have been taken

- (1) Local runoff and groundwater seepage that naturally collect in retention ponds A-1 and A-2 are disposed of through evaporation (These retention ponds are discussed in Sec. III C.1.d.) High pressure spray over the pond's surface facilitates the evaporation process.
- (2) Liquid effluent from retention pond B-3 is evaporated at a spray irrigation plot located on the interdrainage area south of retention pond B-3 or is pumped to the onsite

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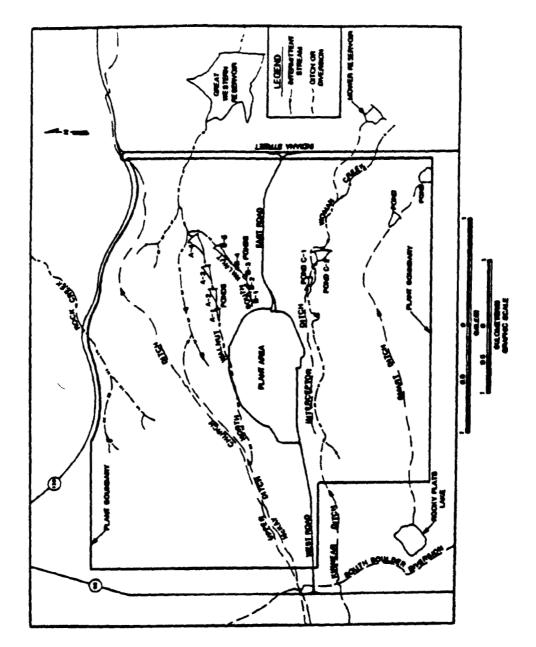


Figure III 3. Map showing Surface Drainage and Retention Ponds at Rocky Flats Plant

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reverse osmosis facility where it is treated or is occasionally released through retention ponds B-4 and B-5 into Walnut Creek, after testing to show compliance with NPDES limitations. (These retention ponds are discussed in Sec IIIC1d) Treated water from the reverse osmosis facility is then recycled in the plant's cooling towers.

(3) An interceptor system was installed between the solar evaporation ponds and Walnut Creek to prevent nitrate solutions from entering Walnut Creek. (The ponds are discussed in Sec. III.C.1.e.) Nitrate waters are pumped back into the solar ponds and are subsequently spray irrigated in the west buffer zone of the plant.

III.C.I.b. Woman Creek Woman Creek is a small intermittent stream that drains the southern portion of the plant. Streamflow is from snowmelt, runoff, precipitation, and from groundwater springs and seeps. The drainage area of Woman Creek west of Indiana Avenue is 21 mi², the majority of which is located within the boundaries of the plant. Woman Creek, east of Indiana Avenue, flows southeast into Standley Lake.

III.C.l.c. Rock Creek Rock Creek is an intermittent stream that flows northeast through the extreme northwest corner of the plant. No surface drainage from the operational areas of the plant enters the Rock Creek basin.

III C 1 d Retention Ponds Retention ponds designated as the A, B, and C series are located along Walnut and Woman Creek (Fig. III 3)

Four retention ponds, located on North Walnut Creek, are designated as A-1, A-2, A-3, and A-4 downgradient from west to east. Ponds A-1 and A-2 are reserved for spill control. Stream flow from North Walnut Creek is diverted past them via a diversion pipe. Pond A-3 receives runoff from the plant and from North Walnut Creek's streamflow. Pond A-4 is designed to handle the 100-yr flood and is used for surface water control and additional storage capacity as a backup to pond A-3.

Five retention ponds, located on South Walnut Creek, are designated as B-1, B-2, B-3, B-4, and B-5, downgradient from west to east. Ponds B-1 and B-2 are reserved for spill control. Pond B-3 receives treated sanitary sewage effluent from the plant's sanitary sewage treatment plant. Ponds B-4 and B-5 receive surface runoff and occasionally discharge from pond B-3 Pond B-5, designed to handle the 100-year flood, is used for surface water control, and receives water from pond B-4

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Two retention ponds are located along Woman Creek south and east of the plant From west to east, they are designated ponds C-1 and C-2, respectively. Pond C-1 is located on Woman Creek. Pond C-2, offset from Woman Creek, receives surface runoff water from an interceptor ditch parallel to the south side of the plant's production areas. Water in pond C-1 is bypassed around pond C-2 into the Woman Creek channel. Water in pond C-2 is discharged downstream into Woman Creek in accordance with NPDES permit limitations.

III.C.i.e. 207 Solar Evaporation Ponds Three lined solar evaporation ponds are on the north-central edge of the main operations area. They are designated as 207A, 207B, and 207C Pond 207B is separated into three sectors north, central, and south.

Ponds 207A and 207C presently contain low-level radioactive liquid process wastes (high in nitrates) being held for evaporation and/or treatment. Pond 207B North receives leachate from a drain system installed on the north-facing hill slope below the solar ponds. At times, intercepted groundwater is transferred from 207B North to a spray irrigation plot on land located in the western portion of the plant site. Pond 207B Center contains treated sanitary sewage water, which is disposed of by spray irrigation. Pond 207B South also contains product water from the sanitary sewage treatment plant to be processed through the reverse osmosis plant and recycled for use in the steam plant or cooling towers.

III.C.I.f. Landfill Retention Pond A retention pond is located on a tributary of North Walnut Creek downstream from the present landfill operation. This pond primarily collects surface runoff that may have contact with the landfill. It also collects leachate from beneath the landfill. To avoid accumulation, water from this pond is spray irrigated onsite onto land south of the landfill after water quality analysis is performed.

III.D. Groundwater

Small amounts of groundwater are in the alluvium and colluvium in the valleys. The major occurrence of groundwater is found in the Rocky Flats Alluvium. Minor amounts occur in sandstone lenses in the Arapahoe Formation, and in the Laramie-Fox Hills Aquifer

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III.D.1. Alluvium and Colluvium in Stream Channels. Alluvium in the stream channels in the valley is quite thin, on the order of 10 ft. It is quite permeable, thus recharge from streamflow is rapid. In areas where streamflow is intermittent, the volume of water in the alluvium will vary rapidly in response to recharge or lack of recharge. Only small amounts of water (usually seasonal) occur in the colluvium on the valley slopes.

III.D.2. Rocky Flats Alluvium The Rocky Flats Alluvium, which is quite permeable, contains groundwater Recharge to the alluvium is from precipitation, snowmelt, and water losses from ditches, streams, and ponds that are cut within the alluvium. The water table fluctuates in response to the recharge. Water levels are highest in the spring from snowmelt and generally decline during the rest of the year.

General water movement in the Rocky Flats Alluvium is from west to east (Fig. III 4) Discharge from the alluvium occurs at minor seeps and springs in the colluvium that covers the contact of the Rocky Flats Alluvium and Arapahoe Formation along the edges of the valleys. The velocity of water movement in the aquifer is estimated at 7 to 18 ft/d (Hurr 1976). Using an average velocity of 12 ft/d, it would take approximately 1 year for water to move from west to east beneath the plant (length of about 1 mi). The hydrologic conductivity of the alluvium is estimated at about 35 ft/d. Data recently collected at Rocky Flats Plant indicate that the velocity of groundwater in the Rocky Flats Alluvium could be lower (HS 1985).

The thickness of the Rocky Flats Alluvium varies because of the irregular surface of the Arapahoe Formation (Fig. III.5). The saturated thickness of the alluvium depends on variable amounts of recharge. The claystone in the Arapahoe Formation tends to restrict and perch water in the overlying alluvium. High areas of the Arapahoe Formation result in thin sections of the overlying alluvium. This results in areas where the alluvium is above the water table. Channels in the Arapahoe Formation will contain thick sections of saturated alluvium (Fig. III.6).

The Rocky Flats Alluvium terminates west of the plant boundary and, therefore, does not supply water to wells located downgradient from the plant. However, discharge of water from the alluvium into surface water and retention ponds does take place.

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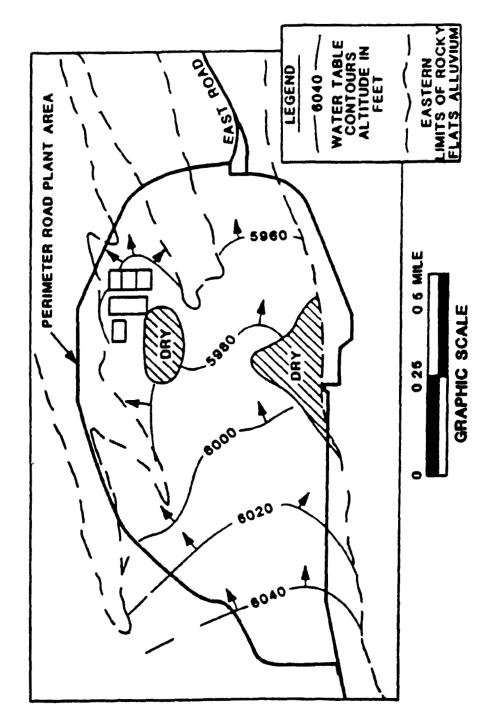


Figure III 4 Water Table Contour Map of the Rocky Flats Alluvium.

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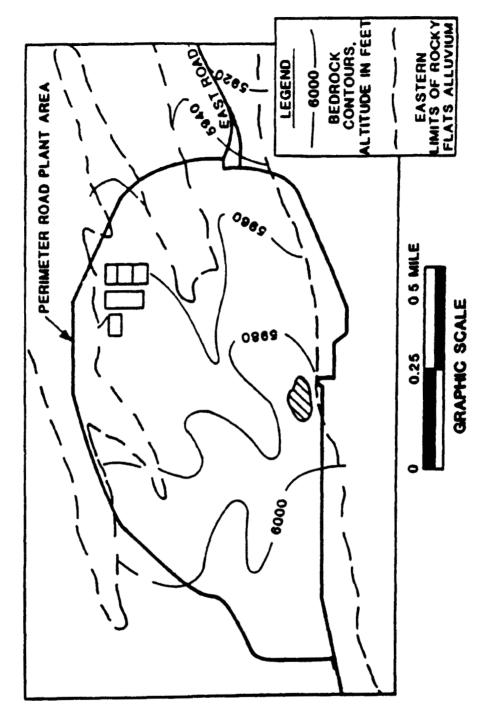


Figure III 5. Bedrock Contour Map on the Top of the Arapahoe Formation.

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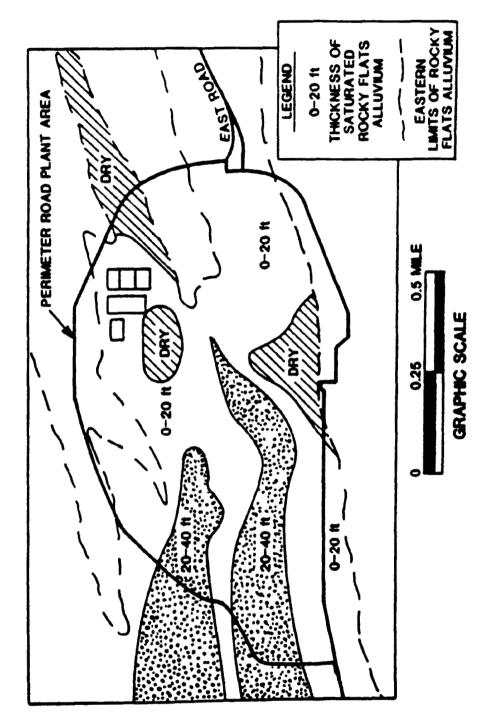


Figure III 6. Saturated Thickness Map of the Rocky Flats Alluvium

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III.D.2.2. Arapahoe Formation Permeable zones in the Arapahoe Formation contain small amounts of water recharged by water from the overlying Rocky Flats Alluvium. The permeable zones are lenticular sands in the claystone. Movement of water in the Arapahoe Formation is eastward. Compared with the Rocky Flats Alluvium, the hydrologic conductivity of the Arapahoe is quite low, estimated at 0.3 to 0.4 ft/d. Assuming a hydrologic gradient of about 0.3 and an effective porosity of 0.10, the pore velocity of water in the Arapahoe is about 0.1 ft/d (Hurr 1976). Data recently collected at Rocky Flats Plant indicate that the velocity of groundwater within the Arapahoe Formation could be lower (HS 1985).

III.D.2.b. Laramie-Fox Hills Aquifer The lower unit of the Laramie Formation and the Fox Hills Sandstones is collectively known as the Laramie-Fox Hills Aquifer These beds are steeply dipping along the western boundary of the plant and flatten quickly to the east in the area of the plant The aquifer is recharged from the limited surface area of the outcrop along the Front Range

The water in the aquifer is moving down-dip from west (zone of recharge) to east. The aquifer is under artesian conditions at the Wind Energy Test Facility in the northwest corner of the plant. A well drilled into the Laramie-Fox Hills Aquifer has a standing water level of about 97 ft (the top of the aquifer is below 900 ft.) The aquifer is of low permeability with specific capacities ranging from 0.1 to 2 gpm/ft of drawdown

Operations at Rocky Flats Plant should result in little, if any, deterioration of water quality in this aquifer. An approximately 800-ft sequence of claystone and then sandstone lenses of the Arapahoe Formation and shales of the upper part of the Laramie Formation overlie the aquifer. The claystone and shale restrict infiltration and recharge from the Rocky Flats Alluvium at the plant along the eastern margin of the bench.

III.E. Water Quality

Water quality data are presented for retention ponds with reference to the NPDES permit limitations, surface water and reservoirs, and groundwater. The data are available in the Rocky Flats Plant's Annual Environmental Monitoring Report (AEMR 1983), monthly reports, and the Rockwell International Environmental Analysis and Control Section's files.

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III.E.1. Retention Ponds Discharges from the plant are monitored for compliance with the appropriate EPA NPDES permit limitations (EPA 1984). These discharges are to offsite sources, North Walnut, South Walnut, or Woman Creek (Fig III 3). The NPDES permit requires reporting when discharge occurs at any of seven designated outfalls, and requires analyses of the discharge. Applicable permit limitations and concentration guides before release are shown in Table III I along with the location of the seven designated outfalls.

The previous NPDES permit (EPA 1981) became effective on May 20, 1981 and expired on June 30, 1984. This permit was given an extension to Dec. 26, 1984. The current permit became effective on Dec 26, 1984 and continues until Dec. 20, 1988.

From the initial date of the previous permit (May 20, 1981), monitoring the discharge for NPDES limitations resulted in no violations in 1981, 1982, or 1983. One technical violation occurred in 1984, and one in 1985. The 1984 technical violation was due to runoff from spray irrigation carrying nitrates into the McKay ditch and bypassing the plant's retention ponds. The measured levels of nitrates were below discharge limits through designated outfalls, however, the discharge did not go through a designated outfall. The 1985 technical violation resulted when water was being transferred from retention pond B-3 to retention pond B-5. Measurements indicated that residual chlorine was slightly above discharge limits during transfer; however, none of the water was discharged from retention pond B-5 until the residual chlorine dropped to an acceptable level.

During 1982, discharge was from ponds A-3, A-4, B-5, and C-2 Monitoring the discharge for NPDES limitations indicated no violations of the NPDES permit. Water from the reverse osmosis pilot plant and reverse osmosis operating plant had no discharge to offsite sources. Concentrations of plutonium, uranium, americium, and tritium in discharges from retention ponds A-4, B-5, C-1, and C-2 were 25% or less of the applicable Radioactivity Concentration Guide (DOE 1981).

Water samples have been collected monthly and composited quarterly from retention ponds B-4 and C-1. Data for year 1983 are presented in Table III.2. Retention pond C-1 has been isolated from plant operations for several years. Water from retention pond C-1 flows into Woman Creek and eventually into Standley Lake.

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Table III-1 NPDES Permit Limitations and DOE Radioactivity Concentration Guides for Waterborne Effluents

NPDES Permit

EPA Designations	Discharge Locations Plant Designation	Drainage
Discharge 001	Pond B-3	Walnut Creek
Discharge 002	Pond A-3	Walnut Creek
Discharge 003	Reverse Osmosis Pilot Plant	Six Locations*
Discharge 004	Reverse Osmosis Plant	Pond B-3**
Discharge 005	Pond A-4	Walnut Creek
Discharge 006	Pond B-5	Walnut Creek
Discharge 007	Pond C-2	Woman Creek

Discharge Limitation#								
Parameter	Monthly Average	Daily Max	Reference					
рН	6 0-9 0 SU	6 0-9 0 SU	NPDES Permit					
Nitrate as N	10 mg/l	20 mg/l	NPDES Permit					
Total Phosphorus	8 mg/l	NA	NPDES Permit					
BOD, 5-day	10 mg/l	25 mg/l	NPDES Permit					
Suspended Solids	30 mg/l	45 mg/l	NPDES Permit					
Total Chromium	0 05 mg/l	0 l mg/l	NPDES Permit					
Residual Chlorine	NA	0.5 mg/l	NPDES Permit					
Oil and Grease	NA	Visual	NPDES Permit					
Fecal Coliform Count	400 organisms/100 mL	(7 day)	NPDES Permit					
Fecal Coliform Count	200 organisms/100 mL	(30 day)	NPDES Permit					
Total Organic Carbon	22 mg/l	30 mg/l	NPDES Permit					

Radioactivity Concentration Guides

Parameter	Discharge Limit	Reference
Plutonium 239,240	<1,667 x 10-9 uCi/ml	DOE Order 5480 I
Uranium 233, 234, 238	200 x 10-9 uCi/ml	DOE Order 5480 I
Americium 241	<1,330 x 10-9 uCi/ml	DOE Order 5480 I
Tritium	<1,000 x 10-6 uCi/ml	DOE Order 5480 I

May be operated at ponds A-3 and A-4 on North Wainut Creek, at Ponds B-4 and B-5 on South Wainut Creek, and ponds C-1 and C-1 on Woman Creek

Sometimes to RO holding ponds and then spray irrigated onsite.

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These limitations are presented as indicators of the types of parameters and associated concentration limits required by the NPDES permit.

Details of these requirements specific to each discharge location are given in the referenced document.

Table III-2 Chemical Quality of Surface Water (1983)

		Retention P		
Element	Pond B-4		Pond C-1	
Lmg/I)	lst Otr.	4th Otr.	1st Otr	4th Otr.
Ag	0 0007	0 0007	0 0003	0 002
Al	0 7	0.4	03	0.5
As	<001	<0.05	<001	<0.05
В	0 07	0 1	0 02	0 09
Ba	<1	<i< th=""><th><1</th><th><!--</th--></th></i<>	<1	</th
Be	<0.05	<0.01	<0.05	<0.01
B ₁	<0 002	<0 002	<0 0008	<0 0009
Ca	60	20	27	20
Cd Ce	<0 01 <0 3	<0.01	<0.01	<0.01
Co	<0.002	<0 4 <0 002	<0 2 <0 0008	<0.2
Ct	<0.002	<0.002	<0.05	<0 0009
Ċ,	<003	<0.04	0 02	<0 05 0 02
Cu	03	0 007	0 02	0 05
Fe	ì	0 1	03	02
Ge	<0 002	<0 002	<0.0008	<0 0009
Hg	<0 002	<0 002	<0 002	<0 0009
K.	16	25	11	15
Li	0 07	0 03	0 05	001
Mg	19	13	6 8	5
Mn	0 2	0 14	0 02	0 03
Mo	0 001	0 001	0 0005	0 0002
Na	41	40	22	20
Nb	<0.02	<0 02	<0.008	<0 009
Ni	0 003	0 007	0 002	0 009
P	<0 02	<0 02	<0.008	<0 009
Pb	0 002	0 0007	0 0005	0 0005
Rb	<0 03	<0.04	<0 02	<0 02
Sb	<0 003	<0 004	<0 002	<0 002
Se	<0 01	<0 01	<001	<001
Si	41	39	7 3	6 2
Sa	<0 003	<0 004	<0 002	<0 002
Sr	07	03	0 2	01
Ta	<0.003	<0 004	<0 002	<0 002
Te	<0.03	<0.04	<0.02	<0 02
Th	<0 003	<0 004	<0 002	<0 002
<u>Ti</u>	0 03	0 02	0 02	0 02
TI	<0 002	<0 002	<0 0008	<0 0009
Ŭ	<0.2	<02	<0.08	<0.09
Y	<0.003	<0.004	<0 002	<0 002
W	<0.2	<0.2	<0.08	<0 09
Ze	02	0 02	0 01	0 02
Zs	<0 003	<0 004	<0.002	<0 002
TDS	349	357	162	171
Atrazine	0.4			
(ug/i)				

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Table III-2 Chemical Quality of Surface Water (1983) (con)
Surface Water and Reservoirs

	Walnut Cree	k at	Great Western	Standley
Element	Indiana		Reservoir	Reservoir
(ms/l)	Ist Otr.	4th Otr.	lst Otr	4th Otr.
48	<0 0004	0 0006	0 0002	0 0002
Al	0 7	>3	0 4	0 09
As	>001	<0.05	<0.01	<001
B	0 04	0 1	0.05	0 02
Ba	<1	<1	<1	<1
Be	<0.05	<001	<0.05	<0.05
Bi	<0 002	<0 002	<0 0006	<0 0006
Ca	58	15	32	30
Cd	<0.01	<001	<001	<0.01
Ce	<04	<03	<01	<01
Co	<0 002	<0 002	<0 0006	<0 0006
Cr	<0.05	<0.05	<0.05	<0.05
Cs	<0.04	0 03	0 0 1	001
Cu	0 03	0 01	001	001
Fe	03	1	01	0.05
Ge	<0 002	<0 002	<0 0006	<0 0006
Hg	<0 002	<0 002	<0 002	<0 002
K	2	25	16	14
Li	0 2	0 06	0 06	0 07
Mg	18	10	61	5.7
Ma	0 03	0 06	0 00\$	0 007
Mo	0 0007	0 0006	0 01	001
Na	46	35	17	12
Nb	<0.02	<0 02	<0 006	<0 006
Ni	0 004	0 009	0 006	001
P	<0 02	<0.02	<0 006	0 006
Pb	0 001	0 001	0 0005	0 0006
Rb	<0.04	<0 03	<001	<001
Sb	<0 004	<0 003	<0 001	<0 001
Se	<0.01	<0.01	<001	<0.01
Si	36	48	1.5	06
Sa	<0 004	<0 003	<0 001	<0 001
Sr	03	0 3	0 08	0 09
Ta	<0 004	< 0 003	<0 001	<0 001
Te	<0.04	<0.03	<0.01	<0.01
Th	<0 004	<0 003	<0.001	<0.001
Ti	0 03	01	0 01	0 005
n	<0.0002	<0 0002	<0 0006	<0 0006
Ü	<0.2	<02	<0.06	<0.06
Ÿ	<0 004	0 009	<0 001	<0.001
W	<0.2	<02	<0.06	<0.06
Za	0 02	0 06	0 007	<0.006
Zs	<0 004	0.006	<0 001	<0 001
TDS	372	316	121	123
Atrazine (ug/l)	<02			

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Because biocides are used for pest and weed control on the plant site, samples are collected and analyzed from retention ponds B-4 and C-1 during biocide application Analytical results for 2, 4-D and Bromacil have been less than 2 ppb. The recommended limit is 100 ppb (AEMR 1983) (See Sec. V B 3 c for a discussion of biocides)

Polychiorinated biphenyls (PCBs) are stored at the plant and are present in some transformer oils and hydraulic systems, each in accordance with EPA Guidance Analytical results of downstream water in 1982, 1983, and 1984 show no detectable concentrations of PCBs above the analytical detection limit of about 1 ppb (AEMR 1983, 1984, 1985) (See Sec V B 3 a for a discussion of PCBs)

III.E.2. Surface Water and Reservoirs Surface water from Walnut Creek at Indiana Street is collected and analyzed for chemical and radiochemical constituents during periods of streamflow Samples analyzed for plutonium, americium, and tritium show concentrations less than 1% of the Radioactivity Concentration Guide (DOE 1981) for water, whereas uranium concentrations were about 25% of the Radioactivity Concentration Guide for water.

The chemical quality of water from Walnut Creek at Indiana Street is shown in Table III 2 for the 1st and 4th quarters of 1983. Chemical quality of water for the 1st quarter from Great Western Reservoir and Standley Lake is also shown in Table III 2. The concentrations indicate no contamination of surface water.

III.E.3. Groundwater Groundwater in the Rocky Flats Alluvium and in the Arapahoe Formation is monitored through a series of 56 observation wells (Fig III 7). The wells are located throughout the area of the plant to monitor retention ponds, evaporation ponds, spray irrigation application west of the plant, burial trenches, and sanitary landfills. The wells range in depth from 10 to 258 ft.

Examples of data for select chemical constituents (Ca, Mg, Na, F, Cl, N, and TDS) in water from wells are shown in Table III 3. Depth of wells is also found in the table.

Nitrate concentrations are present above drinking water standards in the retention ponds, solar ponds, and in effluent used for spray application as irrigation in an area on the western portion of the plant site. Nitrates above drinking water standards also occur in the alluvium near the 207 Solar Evaporation Ponds and at locations in the eastern portion (Table III 3). The spray application is designed to reduce the volume of nitrate

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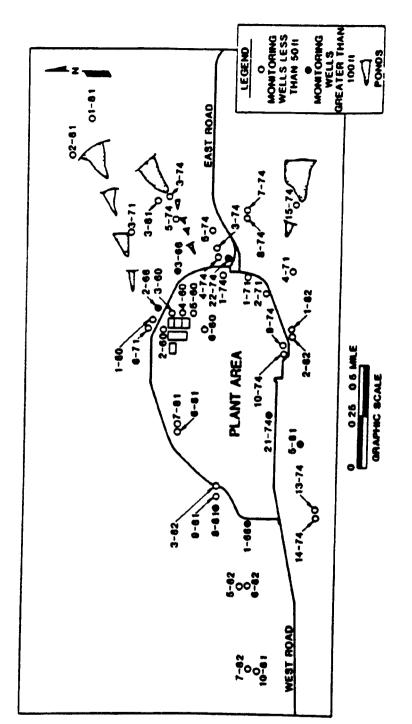


Figure III 7 Location of Observation Wells in and Adjacent to the Plant Area

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Table III 3 Chemical Constituents in Water from Observation Wells .

Well**	Depth				(mg/l)			
Number	(ft)	Ca	Me	Na	F	ĈΙ	N	TDS
1-60	26	390	170	190	0 4	68	200	2533
2-60	23	740	270	730	0 4	438	747	7570
3-60	20	95	25	60	0 4	6	3	475
4-60	18	120	30	170	07	6	67	1020
5-60	19	100	20	40	04	12	18	494
6-60	29	80	25	25	<02	•	3	321
1-66	152	20	5	10	03	2	3	110
2-66	140	55	15	30	03	103	23	393
3-66	145	55	20	100	07	134	2	542
1-71	29	50	15	15	0 4	20	4	230
2-71	29	7	4	140	0 4	48	11	517
3-71	31	95	40	250	0 4	120	< l	1340
4-71	22	20	7	45	03	15	< 1	280
5-71	28	200	35	130	0 4	-	< l	1350
6-71	61	410	85	180	0 4	4	344	2990
1-74	24	190	10	6	0 4	8	12	395
3-74	24	75	10	35	06	15	7	176
5-74	19	25	5	5	•	7	•	385
7-74	50	85	15	10	0 4	•	13	405
8-74	40	75	8	10	0 4	43	8	332
9-74	19	220	35	80	0 4	66	11	1070
10-74	10	380	85	170	06	11	64	2360
13-74	19	6 0	20	75	0 4	27	< 1	498
14-74	5	40	5	25	•	1	-1	159
15-74	19	190	35	80	0 4	77	< I	890
17-74	14	650	140	320	04	720	< I	3180
21-74	258	15	4	45	0.3	6	< 1	186
22-74	199	50	15	40	0.3	•	6	349
1-81	20	50	30	170	0.4	117	< 1	852
2-81	20	55	35	60	0 4	51	2	766
3-81	21	240	80	360	03	200	14	2350
5-81	20	120	30	75	0.4	45	< 1	775
6-81	31	55	15	35	03		1	305
7-81	29	10	10	20	0 2	4	1	277
8-81	100	20	4	20	04	•	< 1	125
9-81	31	30	< 1	25	03	•	< 1	100
10-81	30	20	3	15	<02	44	7	108
1-82	20	90	30	150	07	55	< 1	820
2-82	10	50	15	125	0.5	•	5	513
3-82	27	35	4	15	<0 I	•	5	144
5-82	30	40	3	25	<0 1	11	2	213
6-82	31	30	2	6	0 2	1	< !	\$3
7-82	22	40	5	15	0 4	2	< 1	139

This data is from quarterly samples taken from October 1983.
The last two digits indicate the year of well construction

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effluents in the retention ponds and to control nitrates in offsite discharges to concentrations that meet the NPDES limitations. The rate of nitrate application is within the range typically used for agricultural fertilization.

Elevated values for total dissolved solids (TDS) appear in wells where elevated nitrate concentrations were observed, however, a few wells in the drainage of North and South Walnut Creek and Woman Creek east of the retention ponds also contained TDS in excess of 500 mg/L. This is the national drinking water standard and is used as a baseline value by EPA to determine the extent of groundwater monitoring under RCRA regulations.

In March and April 1985, groundwater samples taken from onsite monitoring wells were determined to contain volatile organic compounds (i.e., trichloroethylene, tetrachloroethylene, 1,1-dichloroethylene, and 1,1,1-trichloroethane). A complete characterization of this contamination plume is currently being performed.

III.F. Air Ouality

Rockwell International's operations are considered to be a minor source of air pollution in the greater Boulder-Denver metropolitan area. Based on air quality monitoring data, Rockwell International operations appear to be in compliance with state and federal air pollution regulations, however, the total plant emission of volatile organic compounds to the atmosphere is not well defined. The Denver metropolitan area is a nonattainment area for ozone. Rockwell International is not considered to be a cause of the nonattainment. Discussion of atmospheric releases from Rocky Flats Plant is presented in Sec. V B 4 a.

III.G. Environmentally Sensitive Conditions

There are no known environmentally sensitive conditions such as critical habitats for threatened or endangered species as identified in 50 CFR Part 402 or wetlands greater than 5 acres in size as defined in Executive Order 11990 near Rocky Flats Plant that warrant attention under the HRS evaluation (see Appendix B). However, small areas around the stream channels, retention ponds, seeps, and springs appear to qualify as wetlands, and may require wetland assessments when impacted by future plant operations.

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IV ENVIRONMENTAL LAWS APPLICABLE TO ROCKY FLATS PLANT

The Department of Energy (DOE), its predecessors, and operating contractors were in operation long before the present environmental laws were enacted. During this time, DOE, its predecessors, and contractors were guided by internal guidelines and standards and by the Atomic Energy Act of 1954 with regard to pollution and radiation control

Presently, DOE and its operating contractors are guided by the existing applicable environmental laws and by DOE orders. Rocky Flats Plant's compliance with the environmental laws that apply to its facility is discussed below

IV.A. Comprehensive Environmental Response, Compensation, and Liability Act.

Current CERCLA regulations address inactive waste sites from the standpoint of bazardous and toxic substances. Potential CERCLA sites are identified in Section V.A. Some of the sites identified may be considered to be continuing release sites under the RCRA. Sites are given a numerical hazardous ranking based on various site and waste characteristics. Sites that receive a numerical Hazard Ranking System (HRS) Migration Mode score above the value of 28.5 are included on the National Priorities List (NPL) for clean-up. Effective Feb. 18, 1986, federal facilities may be included on the NPL. The HRS Migration Mode scores for Rocky Flats Plant are presented in Sec. V.A. and in Appendix B. Because some of the sites received scores greater than the threshold value of 28.5, the Rocky Flats Plant may be included on the NPL.

In addition, CERCLA requires reporting releases of hazardous substances from facilities that exceed reportable quantities, as specified in 40 CFR 302. Policy for reporting events of this kind has been established at Rocky Flats Plant. Procedures will be included in the spill prevention control and countermeasure plan (SPCC).

IV.B. Resource Conservation and Recovery Act

This act establishes the authority to regulate solid wastes including nonhazardous solid waste, hazardous chemical waste, recycling operations, and underground storage tanks. The State of Colorado has received authorization for RCRA programs except for the 1984 amendments.

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The Rocky Flats Plant operates a landfill for the disposal of nonradioactive non-hazardous waste and generates a variety of hazardous chemical and/or radioactive wastes Landfill operations and management of hazardous chemical wastes are regulated under the RCRA as indicated below

IV.B.1. Guidelines for the Land Disposal of Solid Waste (40 CFR 241)/Colorado Solid Waste Disposal Sites and Facilities Law/Colorado Waste Facility Siting Rules. Colorado regulations set minimum standards for landfills and require a certificate of designation from the local county to operate a nonradioactive nonhazardous solid waste disposal facility. In January 1979, the State of Colorado Department of Health (CDH) inspected the present landfill at the Rocky Flats Plant and filed a landfill acceptance letter stating that the landfill complied with minimum standards and did not need a certificate of designation (CDH 1979). Standard operating practices for the present landfill are in accordance with the requirements of federal and state regulations. However, small quantities of radionuclides and hazardous chemicals may be in the landfill from past disposal practices and/or occasional errors in segregating wastes (see Sec V A 3.c).

IV.B.2. Colorado Hazardous Waste Notification and Permit Rules These rules require facilities to prepare RCRA Part A and Part B applications for state-issued RCRA permits. The applications must describe in detail how hazardous wastes are managed at the facility. A revised Part A was submitted to the state and to EPA in May 1985, and the Part B was submitted on Nov. 1, 1985.

On Nov 20 1985, the CDH notified the Rocky Flats Plant of its intent to deny the Part B permit unless certain specified information was provided to CDH by Dec. 3, 1985 On Dec 4, 1985, CDH issued a notice of intent to terminate interim status and to deny a state hazardous waste Part B permit application for hazardous waste treatment, storage, and disposal at the Rocky Flats Plant. The tentative denial is based on failure to provide requested information on: (1) groundwater contamination, (2) management of mixtures of radioactive and hazardous chemical waste, and (3) groundwater monitoring (CDH 1986)

IV.B.3. Colorado Hazardous Waste Act/Colorado Hazardous Waste Management Regulations/Colorado Standards for Owners and Operators of Hazardous Waste Treatment. Storage, and Disposal Facilities. The Colorado Hazardous Waste Act, Colorado Hazardous Waste Management Regulations, and the Colorado Standards for

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Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities provide the Colorado implementation of RCRA hazardous waste programs as outlined in 40 CFR 260-267 These regulations outline the requirements for generators, transporters. and owners of treatment, storage, and disposal facilities that handle hazardous chemical waste Source, special nuclear, and by-product materials as defined by the Atomic Energy Act are excluded from these regulations. However, mixtures of bazardous chemical waste and other types of solid waste are subject to Colorado's hazardous waste regulations

The Rocky Flats Plant generates a variety of radioactive and hazardous chemical wastes including by-product materials (radioactive materials either directly yielded in the process, or made radioactive as a direct and necessary consequence of the process of producing or utilizing special nuclear material (50 FR 45736)), candidate mixed wastes (nonby-product wastes that, because of the process by which they are generated, inherently contain both radionuclides and EPA-listed hazardous chemicals), and nonradioactive hazardous chemical wastes (waste that contains an EPA-listed constituent or that has an EPA hazard characteristic) While some of these wastes are managed individually, others are mixed together within the waste treatment process and handled as a single waste unit The generation of candidate mixed waste and the deliberate mixing of different waste streams (see Sec. V.B 2.b) present some regulatory concerns. The management jurisdiction of candidate mixed wastes between DOE, EPA, and the state needs to be resolved. In addition, the deliberate mixing of RCRA-regulated waste with by-product material and/or candidate mixed wastes needs to be evaluated to determine whether waste streams should continue to be mixed and the resulting waste possibly regulated under RCRA, or whether the waste streams should be segregated and managed individually as by-product waste and RCRA-regulated waste. Once a determination has been made as to which processes will handle RCRA-regulated waste, the facilities and processes used to treat RCRA-regulated waste will need to be evaluated for compliance with RCRA standards.

IV.B.4 1984 RCRA Amendments. The 1984 RCRA amendments added some additional hazardous waste management requirements including: (I) making a biennial inventory of federal facility hazardous waste activities; (2) taking an inventory of underground storage tanks that contain petroleum and CERCLA hazardous substances: (3) retrofitting interim status surface impoundments to comply with the double-liner, leachate collection and groundwater monitoring requirements, or terminating their use.

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The Rocky Flats Plant submitted an inventory of hazardous waste activities in January 1986, and they are currently compiling an inventory of underground storage tanks to meet the May 1986 reporting requirements to EPA

IV.C. Toxic Substances Control Act

This act establishes a list of chemicals defined as toxic, for which the manufacture, uses, storage, handling, and disposition are regulated. This act specifically identifies PCBs and requires that all use of PCBs be in a "totally enclosed manner" to ensure that exposure of human beings or the environment to PCBs will be insignificant. All items containing PCBs at the plant are marked in accordance with TSCA regulations, and all PCBs awaiting disposal are stored in approved locations. Currently, several drums of noncombustible, solid, radioactive PCB- contaminated material (metals) are in storage at the plant. This waste will be shipped offsite for disposal when an EPA-approved disposal technology is developed for this type of material (see Sec V B 3 a). Storage is in accordance with the TSCA requirements for PCB-containing items

IV.D. Clean Air Act

The Clean Air Act sets national policy to maintain air quality and control air pollution. The EPA has established National Ambient Air Quality Standards (NAAQS), National Emission Standards for Hazardous Air Pollutants (NESHAPS), New Source Performance Standards (NSPS), and regulations for visibility protection and Prevention of Significant Deterioration (PSD) of air quality. The NAAQS, NESHAPS, NSPS, and PSD requirements are implemented in Colorado through the State Implementation Plan (SIP) as indicated in the following sections.

IV.D.1. Colorado's Air Quality Control Act. This act establishes State of Colorado policy and authority to implement the SIP and to control air pollution by promulgating regulations.

IV.D.2. Colorado's Ambient Air Ovality Standards. These standards implement the NAAQS for Colorado and set maximum contaminant levels for ambient air concentrations of total suspended particulates, sulfur dioxide, oxidant (ozone), carbon monoxide, and nitrogen dioxide. The Denver metropolitan area is a nonattainment area for ozone, carbon monoxide, and total suspended particulates.

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The Rocky Flats Plant conducts a monitoring program for total suspended particulates, sulfur dioxide, ozone, carbon monoxide, and nitrogen dioxide (Sec VB5a). The monitoring data are summarized in the annual environmental monitoring reports, and indicate compliance with all ambient standards except ozone. Ozone concentrations are typical of levels found in the Denver metropolitan area. This regional photochemical oxidant problem is believed to be caused by urban transportation sources.

IV.D.3. Colorado's Air Pollution Control Regulations. The Colorado Air Pollution Control Regulations establish emission control regulations and emission monitoring requirements to achieve and maintain air quality, including. (1) implementation of the NAAQS for lead and NESHAPS for asbestos, mercury, and beryllium, (2) specification of new source performance standards, PSD review requirements, and regulations for preserving Class I visibility, and (3) regulation of emissions of volatile organic compounds (VOCs) that contribute to ozone formation. The use of solvents for cleaning/degressing is carefully regulated, and disposal of VOCs by evaporation or spillage in quantities exceeding 10 gal is prohibited in nonattainment areas.

The regulations also require owners to file an Air Pollution Emission Notice (APEN) and obtain an emission permit for new facilities (constructed after Feb. 1, 1972) that will emit air pollutants and for facilities with significant changes in air emissions. The permits define control strategies and set emission limits to prevent deterioration of air quality.

The Rocky Flats Plant (contractor and subcontractors) complies with state implementation of NESHAPS by (1) providing notice to the state for asbestos demolition activities and conforming to specific requirements for asbestos handling, and (2) controlling and monitoring releases of beryllium from the beryllium shop in accordance with state emission and reporting requirements. The plant also files APENs with the state for plant emission sources, submits required air monitoring data to the state in the annual environmental monitoring report, and conducts a vehicle inspection program for plant vehicles.

A complete inventory of VOC emissions from plant operations, including the air sparge (evaporation) disposal of carbon tetrachloride, should be conducted to determine whether VOC releases exceed the VOC emission standard for nonattainment areas.

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IVE. Clean Water Act

The CWA establishes national authority to maintain water quality and control water pollution. Effluent releases to surface waters are regulated through the National Pollutant Discharge Elimination System (NPDES) program. The NPDES program for the State of Colorado is administered by the EPA, Region VIII. Other water quality control programs are administered by the State of Colorado.

IV.E.1. National Pollutant Discharge Elimination System Rocky Flats Plant has a NPDES permit that covers seven outfalls from the plant (outfalls 001, 004, and 006 to South Walnut Creek, outfalls 002 and 005 to North Walnut Creek; outfall 007 to Woman Creek, and outfall 003, a mobile outfall from the reverse osmosis pilot plant that may be operated at ponds A-3 and A-4 on North Walnut Creek, at ponds B-4 and B-5 on South Walnut Creek, and ponds C-1 and C-2 on Woman Creek) This permit gives specific limits for each outfall tailored to the upstream inputs. The current Rocky Flats NPDES permit (effective Dec. 26, 1984) is issued and permitted by the Environmental Protection Agency, Region VIII, and is listed as permit number CO-0001333.

New NPDES permit regulations promulgated on Sept. 26, 1984, require that all storm-water discharges from point sources (defined to include pipes, conduits, ditches, and channels) must be covered by NPDES permit. The original effective date for application of Oct 26, 1984 has been delayed until Dec 31, 1987 for Group I and June 30, 1989 for Group II (50 FR 35200)

IV.E.2. Colorado's Water Quality Control Act/Colorado's Discharge Permit System Regulations. The act and regulations provide the state authority for implementing the NPDES program in the state of Colorado. NPDES permits issued by the EPA are sufficient to satisfy state requirements.

IV.E.3. Colorado's Water Quality Control Regulations/Colorado's Water Quality Standards. The regulations and standards establish effluent limitations and basic standards to prevent degradation of state waters. The standards prohibit any increase in radioactive materials in groundwater over naturally occurring concentrations without an approved exemption by the state. They also stipulate maximum radionuclide (Cs-134, Pu-238, Pu-239, Pu-240, Ra-226, Ra-228, Sr-90, Th-230, Th-232, and H-3) concentrations for surface waters. Concentrations of toxic materials in state waters must not preclude bene-

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ficial use of the water. Measured surface water concentrations of radionuclides from the plant are below applicable standards. Plutonium at low concentrations has been detected in the groundwater (see Sec V B 5)

IV.F. Safe Drinking Water Act

The Safe Drinking Water Act establishes drinking water standards for public drinking water systems (40 CFR 141) and provides for the protection of underground drinking water sources.

The Rocky Flats Plant receives domestic supply water from Raiston Reservoir and the South Boulder Diversion Canal Water is treated at a water treatment plant onsite (Sec VB2e) and is tested in accordance with the requirements for public drinking water systems. The domestic water supply at the plant routinely meets all the national interim primary drinking water standards

IV.G. Federal Insecticide. Funzicide, and Rodenticide Act

This act, as amended, contains federal regulations governing the manufacture and use of biocides. Promulgated under this act, 40 CFR 162 provides the registration procedures and identifies restricted use pesticides, and 40 CFR 165 establishes the recommended procedures for disposing of and storing pesticide containers and residues. The State of Colorado has also enacted legislation governing the use of pesticides and the certification of pesticide applicators.

The use of biocides at the plant is accomplished in accordance with both state and federal regulations (Sec. V.B 3.c). A 1984 appraisal by the DOE of the plant's practices resulted in changes in procedures to ensure proper administrative control.

IV.H. National Environmental Policy Act

The National Environmental Policy Act requires preparation of environmental impact analyses for all federal actions that may adversely affect the environment. DOE Order 5440.1C and AL Order 5440.1B implement the NEPA requirements for DOE facilities under its jurisdiction.

In accordance with the requirements of AL 5440 1B, the Rocky Flats Plant prepares an action description memorandum (ADM) as part of the funding cycle for all major

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projects implemented at the plant. The ADMs are reviewed by the Safety Analysis and Facility Engineering groups at the plant, and submitted to the Budget Office for transmission to the DOE Area Office, DOE-AL, and DOE-HQ DOE makes the determination of whether further NEPA documentation is needed. One environmental impact statement (EIS), which covers routine plant operations, was prepared for the Rocky Flats Plant (RFEIS 1980). Subsequent ADMs have been tiered to the EIS. In addition to the ADM process, other construction activities are also reviewed by the Safety Analysis and Facility Engineering groups at the plant to evaluate health, safety, and environmental concerns.

IV.I. National Historic Preservation Act

Four sites have been identified that may require evaluation under provisions of the National Historic Preservation Act; the Lindsay Ranch site, an old railroad bed circa 1880, a stone house circa 1900, and the Antelope Springs site. Historic review procedures need to be established for the Rocky Flats Plant. They may be included as part of the NEPA review process, as appropriate.

IV.J. Compliance with Floodplain/Wetlands Environmental Review Requirements

The DOE compliance with Floodplain/Wetlands Environmental Review Requirements as promulgated in 10 CFR 1022, requires proper documentation of any action impacting a wetland. This documentation includes publishing a notice in the Federal Register and subsequently preparing a Floodplain/Wetland Assessment. The Floodplain/Wetland Assessment may be a separate document or a section within a NEPA document such as an Environmental Assessment (EA) or Environmental Impact Statement (EIS). Floodplain/Wetland Assessments have not been prepared in the past for operations at Rocky Flats Plant; however, since small areas adjacent to seeps, springs, and water courses may qualify as wetlands, future actions at the plant may require such an evaluation.

IV.K. National Dam Inspection Act

This act, passed by Congress in 1972 (PL 92-367), established a comprehensive national program to inspect and regulate dams for safety purposes. Responsibility under the law was delegated to the Army Corps of Engineers. The Office of the State Engineer, Division of Water Resources sent a letter to DOE on Feb. 21, 1984 expressing concern over high water in holding pond dams from snowmelt. This letter quoted state statutes 37-87-

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104 promulgated in 1973 that make owners of reservoirs liable for flood damage (from leakage or overflow). In accordance with the requirements, DOE has had the Army Corps of Engineers (Omaha Office) conduct periodic inspections of all dams on plant property. To date, all of the dams have passed inspection.

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V FINDINGS AND PLANNED FUTURE ACTIONS

This chapter is divided into two parts. Section V.A. discusses all sites the CEARP Phase I review process identified as having known or possible contamination and the potential to release contaminants into the environment. Section V.B. presents an overview of waste generation activities, waste management activities, and potential pathways for environmental release.

V.A. Potential CERCLA Sites - Inactive or Former Disposal Facilities, Activities, Spills and Leaks

Potential CERCLA sites identified during CEARP Phase I (the equivalent of DOE CERCLA Order Phase I) are presented in this section. The CEARP findings are presented based on a negative, positive, or uncertain finding for the following EPA CERCLA program elements: (I) Federal Facilities Site Discovery and Identification Findings (FFSDIF) and (2) Preliminary Assessments (PA), Site Inspections (SI) [SI in CEARP is a preliminary SI (PSI)], and Hazard Ranking System (HRS) evaluation [including the DOE modified HRS (MHRS) evaluation]. The HRS and MHRS evaluations are presented in Appendix B. During the supplemental portion of CEARP Phase I, the locations of all sites determined to require further investigation will be mapped. In addition, recommissance field data will be collected so that HRS/MHRS evaluations can be performed for those sites currently lacking sufficient information to be scored.

Many of the identified sites warrant further action in terms of site characterization under CEARP Phase II. The actual investigational techniques to be used will be determined during the initial Phase II efforts, and the result will be a detailed monitoring plan. This effort will include some simple preliminary site characterization that will define land surface characteristics, soil types, and underlying rock using field inspection and additional interpretation of published reports. In addition to surface and groundwater pathway investigations (Sec. V B.4.b and V.B.4 c), the detailed site characterization may include any and all of the following:

(1) Site Size and Location. Various geophysical techniques, such as resistivity, magnetic survey, ground penetrating radar, side-scan radar, core drilling, and logging of test holes, will be used as appropriate to determine the physical dimensions of a site.

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- (2) Characterization of Site Contents. An analysis of surface and subsurface samples will be made to determine the source term of hazardous substances contained at a site. Parameters of interest could include any and all materials recognized as hazardous, including organics, metals, solvents, and radioisotopes. The specification of analyses to be performed will be based on information about what was or may have been disposed of at the site as well as some screening for a full range of potential contaminants of concern. Samples to be taken may be from surface water, groundwater, sediments, cores from boreholes, vapors, or other media considered important. The methodology for all sampling and analyses will conform to protocols and quality assurance requirements specified by EPA or DOE where appropriate.
- ety of geohydrologic and analytical techniques will be used to determine the presence or absence of existing migration and the potential for future migration of contaminants away from sites confirmed to contain a source of concern. This investigation will determine the quantity of contaminants already in the pathway, using some of the techniques already mentioned. It will verify or obtain information on pathway parameters in the immediate vicinity of the site to enable estimates to be made of the potential for future migration and of the likely receptors of this migration.

V.A.I. Inactive Isolated Sites. Based on a detailed records search, preliminary site inspection, and interviews with plant employees, inactive sites at Rocky Flats Plant were placed into three categories: (1) areas that might have received radioactive waste or contamination, (2) areas that might have received both radioactive and hazardous chemical wastes or contamination, and (3) areas that might have received nonradioactive hazardous chemical wastes or contamination.

YA2 Sites with Possible Radioactive Waste or Contamination. Rockwell International performed an onsite radiometric survey from 1975 to 1983 to locate and remove surface radioactive contamination from areas outside of buildings. Any radioactive material identified was subsequently removed. All locations found to have materials above background levels (except for several isolated locations within the 900 Area) have been decontaminated. All materials removed were packaged as radioactive waste and shipped offsite for disposal. Contamination from many of the sites listed below was removed during this survey work. Records of the operation exist as monthly memos-to-file, a detailed summary will be prepared during CEARP Phase II (Sec. V B 6 c). The phrase

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"the radiometric survey" in this report refers to this 1975-1983 survey and decontamina-

Table V-1 lists all buildings at Rocky Flats Plant that contain radioactive materials. All of these buildings are currently being used. Table V-2 lists potential CERCLA sites at the plant identified as having contained radioactivity. These sites are discussed in the same order as they are listed in Table V-2.

Persons interviewed during CEARP Phase I mentioned that most of the buildings, identified in Table V-1, may have radioactive contamination underneath them and in some cases, radioactive contamination may exist in the buildings' footing drains. Because these buildings are in use, no action will be taken until a building is removed. Then the area underneath the building will be monitored and decontaminated as appropriate However, during CEARP Phase II, this contamination will be studied for potential releases through the various pathways under existing conditions and appropriate action will be taken if required.

V.A.2a. Radioactive Soil Burial 300 Area. Persons interviewed mentioned that some low-level radioactively contaminated soil, collected from around Building 774, is now covered by the Building 334 parking lot. The person responsible for removing the soil indicated that it was removed prior to constructing the parking lot and was placed east of the 207 solar evaporation ponds within the 900 Area (PC 1985a).

CERCLA Finding - Remedial action completed; verification will be made under CEARP Phase V, therefore, a CERCLA finding for FFSDIF, PA, and PSI is not appropriate, nor is HRS and MHRS Migration Mode scoring.

Planned Future Action - The radiometric survey data will be compiled by CEARP and used to verify and to document the adequacy of the remedial action. In addition, steps will be taken to identify and plan for any continuing monitoring requirements needed to demonstrate control of any potential migration or to recognize future problems adequately. Based on the results of these data, appropriate action will be taken.

<u>V.A.2.b.</u> Radioactive Site. 400 Area. Prior to 1973, ground areas around Building 444 and around Building 442 were known to contain very low levels of uranium (Owen 1973) Surface radioactivity was removed down to background levels during the radiometric survey.

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Table V-I Buildings Containing Radioactive Materials

Building	Facility Designation	Principal Element
371	Plutonium Recovery	Plutonium
374	Waste Treatment	Plutonium
444	Manufacturing	Uranium
447	Manufacturing	Uranium
559	Plutonium Analytical Laboratory	Plutonium
707	Manufacturing	Plutonium
771	Plutonium Recovery	Plutonium
774	Waste Treatment	Plutonium
776	Manufacturing	Plutonium
777	Assembly	Plutonium
779	Plutonium Development	Plutonium
865	Materials Development Laboratory	Uranium
881	Manufacturing	Uranum
883	Rolling and Forming Facility	Uranium
886	Nuclear Safety Facility	Plutonium
889	Decontamination Facility	Uranium
991	Research and Development	Pluconium

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Table V.2 Potential CRCLA Sites Identified buring CEASP Phase I with Possible Suchemetive thate or Contemination

		CONTRACTOR EL CONTRACTOR DE CO	Compliance and Verification (Phase V)	Compilance and varidication	Compliance and Verification	Compliance and Verification		Installation Assessment (Phose 1, Supplements)	Compliance and Verification	Compliance and Varification	Installation Assessment		Confirmation (Phase !!)
	BA CERCIA		į	i	i	i		<u>\$</u>	i	i	i		į
	î ŝ		1	1	•	s		¥	1	1	¥		•
			1	ı	1	\$		•	í	í	¥		R
2	france/payes		'	1	1	1		Pesitive	ı	í	Pesitive		Pasitiva
	Statu		I	Inactiva/ Cleanad	Inactiva/ Cloanad	Insectival Closes		Inective	Inectiva/	Inectifus and inectifus	Inective		inactive/ Congress
	2112		(300 Area)	Bad Site (488 Area)	And Sites (2) (500 Area)	And Silvas (2) (480 Arms)	(3) at 11 (4) (5) (4)	- •	Site 2	81te 3	\$ •118	And Sites (2) (800) Area	1 ***

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Table V 2. Potential CERCIA Sites Identified Buring CEARP Place | uith Possible Redisective Units or Centurination (can)

Planned Tuture Action	CEARLICINGS Order Phase	Compliance and Varification (Phase V)	Annodial Action (Phase IV)	Compliance and Verification (Phase V)
EPA CENCIA	Creecas Elsans	i	ŝ	<u>:</u>
	E SCOTO	á	1	:
KAR	finding Score	1	•	1
11811	7	1	1	á
	No.	Closed	Pertially Pertially	Inactiva/ Cleaned
	SI II	8ite 2	983 Lip Area (908 Area)	Triangle Area (900 Area)

Paderal facility Site Discovery and Identification Findings/Praticinary Associated Prolicinary Site Impactions The Maserd Amiling System/DE Hadified Second Earling System

Comparantion, and Liability Act ntel Accessment and Acapense Program/Comprehensive Environmentel Beapanse, Comprehensive Sevinan Let Applicable Let Evaluated

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CERCLA Finding - Remedial action completed, verification will be made under CEARP Phase V; therefore, a CERCLA finding for FFSDIF, PA, and PSI is not appropriate, nor is HRS and MHRS Migration Mode scoring

Planned Future Action - The radiometric survey data will be compiled by CEARP and used to verify and to document the adequacy of the remedial action. In addition, steps will be taken to identify and plan for any continuing monitoring requirements needed to demonstrate control of any potential migration or to recognize future problems adequately. Based on the results of these data, appropriate action will be taken

V.A.2.c. Radioactive Sites (2). 500 Area. An area north of Building 551 was used to load boxed radioactive material into railroad cars. Some of the boxes leaked. Persons interviewed indicated that residual radioactive contamination may have remained at this site. In addition, a process waste line ruptured in 1977, flooding a waste collection tank near Building 559. The material was confined to the waste tank and the soil around the lines. The area was subsequently cleaned up (PC 1985b). Residual surface radioactivity should have been detected and removed from both sites during the radiometric survey.

CERCLA Finding - Remedial action completed; verification will be made under CEARP Phase V, therefore, a CERCLA finding for FFSDIF, PA, and PSI is not appropriate, nor is HRS and MHRS Migration Mode scoring.

Planned Future Action - The radiometric survey data will be compiled by CEARP and used to verify and to document the adequacy of the remedial action. In addition, steps will be taken to identify and plan for any continuing monitoring requirements needed to demonstrate control of any potential migration or to recognize future problems adequately. Based on the results of these data, appropriate action will be taken

VA.2.d. Radioactive Sites (2), 600 Area. Records and interviews indicate that two locations within the 600 Area may contain residual low-level radioactive contamination from plutonium (the Building 444 parking lot and the area east of this parking lot and west of Building 664). The surface soil was removed from both areas in the early 1970s; however, some of those interviewed mentioned that small amounts of plutonium may have remained (Owen 1973). Residual surface radioactivity should have been detected and removed during the radiometric survey.

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CERCLA Finding - Remedial action completed, verification will be made under CEARP Phase V; therefore, a CERCLA finding for FFSDIF, PA, and PSI is not appropriate, nor is HRS and MHRS Migration Mode scoring

Planned Future Action - The radiometric survey data will be compiled by CEARP and used to verify and to document the adequacy of the remedial action. In addition, steps will be taken to identify and plan for any continuing monitoring requirements needed to demonstrate control of any potential migration or to recognize future problems adequately. Based on the results of these data, appropriate action will be taken.

V.A.2.e. Radioactive Sites (4), 700 Area.

Site 1. Shortly after the 1969 fire, an area north of Building 776 was radioactively contaminated (Owen 1973). This area was subsequently covered with gravel, and those interviewed mentioned that it probably was not decontaminated prior to being covered.

CERCLA Finding - Positive for FFSDIF, PA, and PSI, however, there is not sufficient information to calculate HRS and MHRS Migration Mode Scores.

Planned Future Action - The radiometric survey data will be compiled by CEARP These data will be used to evaluate the current status of this site. If warranted, a CEARP reconnaissance field study will be conducted to determine the presence or absence of residual radioactivity and the potential for migration into various environmental pathways. Based on the results of these data, appropriate action will be taken.

Site 2. Some of those interviewed mentioned that during 1974, monitoring pavement on 8th Street located several radioactively contaminated spots. The corrective action taken was to pave over the street. The paving has effectively immobilized these isolated spots of radioactive contamination.

CERCLA Finding - Remedial action completed; verification will be made under CEARP Phase V; therefore, a CERCLA finding for FFSDIF, PA, and PSI is not appropriate, nor is HRS and MHRS Migration Mode acording.

Planned Future Action - Steps will be taken to identify and plan for any continuing monitoring requirements needed to demonstrate control of any potential migration or

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to recognize future problems adequately. If this paving is ever removed, it will be handled as radioactive waste and shipped offsite for disposal

Site 3. An open area at the north side of Building 774 was mentioned as a location used to wash radioactively contaminated equipment. The effluent from this process flowed onto the ground. Any residual surface contamination at this location should have been detected by the radiometric survey, and any contaminated materials would have been packaged and shipped offsite for disposal.

CERCLA Finding - Remedial action completed; verification will be made under CEARP Phase V; therefore, a CERCLA finding for FFSDIF, PA, and PSI is not appropriate, nor is HRS and MHRS Migration Mode scoring.

Planned Future Action - The radiometric survey data will be compiled by CEARP and used to verify and to document the adequacy of the remedial action. In addition, steps will be taken to identify and plan for any continuing monitoring requirements needed to demonstrate control of any potential migration or to recognize future problems adequately. Based on the results of these data, appropriate action will be taken.

Site 4. Out-of-service, radioactive, laundry waste tanks exist south of Building 771. These tanks were disconnected from their respective source systems; however, they periodically fill with groundwater that has to be pumped into the new process waste system. Persons interviewed suggested that these tanks may have leaked laundry waste while in use. Materials introduced into the environment from leaks in these tanks (mostly water with small amounts of detergent) would no longer be detectable except for radioisotopes.

CERCLA Finding - Positive for FFSDIF, PA, and PSI, however, there is not sufficient information to calculate HRS and MHRS Migration Mode Scores.

Planned Future Action - The tanks will be included in the onsite tank inventory (Sec. V B 6 d). The radiometric survey data will be compiled by CEARP. These data will be used to evaluate the current status of this site. If warranted, a CEARP reconnaissance field study will be conducted to determine the presence or absence of residual radioactivity and the potential for migration into various environmental pathways. Based on the results of these data, appropriate action will be taken.

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V.A.2.f. Radioactive Sites (2), 800 Area

Site 1. An area east of Building \$81 was used to dispose of 320 tons of plutonium-contaminated soil (about 7 dpm/g alpha activity) from the Building 776 fire (1969 time frame) and to dispose of approximately 60 yd of plutonium-contaminated soil (about 250 dpm/g alpha activity) from the Building 774 waste storage tank area. This contamination was covered with approximately 3 ft of soil and fill material (Owen 1973)

CERCLA Finding - Positive for FFSDIF, PA, and PSI, HRS Migration Mode Score 20, MHRS Migration Mode Score 0 (Appendix B)

Planned Future Action - A CEARP Phase II reconnaissance field study will be conducted to determine the levels of residual radioactivity and the potential for migration into various environmental pathways. Based on the results of these data, appropriate action will be taken.

Site 2. In 1958, an area of several hundred square feet located northwest of Building 881 was radioactively contaminated by a concrete slab that had been removed from the side of Building 776. The slab was broken up and the area was cleaned; however, these activities may have resulted in some low-level contamination (Owen 1973). Any remaining surface contamination should have been detected and removed during the radiometric survey.

CERCLA Finding - Remedial action completed; verification will be made under CEARP Phase V, therefore, a CERCLA finding for FFSDIF, PA, and PSI is not appropriate, nor is HRS and MHRS Migration Mode scoring.

Planned Future Action - The radiometric survey data will be compiled by CEARP and used to verify and to document the adequacy of the remedial action. In addition, steps will be taken to identify and plan for any continuing monitoring requirements needed to demonstrate control of any potential migration or to recognize future problems adequately. Based on the results of these data, appropriate action will be taken.

V.A.2s. 903 Lip Area. 900 Area. During drum removal and cleanup activities associated with the 903 drum storage area, winds redistributed plutonium beyond the pad to the east. Approximately 1 Ci of plutonium was deposited between the pad and the security fence Partial cleanup of this area, referred to as the 903 Lip Area.

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occurred in 1978 when about 4.7 million lbs of contaminated soil containing 0.56 Ci plutonium was removed, packaged, and shipped offsite as radioactive waste (Barker 1982) Radioactive contamination is known to exist in the 903 Lip Area, and additional material is being removed

CERCLA Finding - Radioactivity is still being removed from this site; therefore, it is considered to be in CEARP Phase IV A CERCLA finding for FFSDIF, PA, and PSI is not appropriate, nor is HRS and MHRS Migration Mode scoring.

Planned Future Action - The additional data collected during the remainder of the remedial action phase will be evaluated under CEARP to determine whether any actions are required to remedy or control environmental problems. Based on the results of these data, appropriate action will be taken.

V.A.2.h. Triangle Area. 900 Area. The triangle area, located east of the 207 solar evaporation ponds and inside the security fence, was used from 1966 to 1975 for surface storage of plutonium-contaminated waste (ash heels and Fulfio filters) and of plutonium-contaminated equipment and materials from cleanup of the 1969 fire. By 1971, all this material had been placed into about 10 cargo containers. Subsequently, leaks from the cargo containers were detected, and a program was started to box all this material (including the cargo containers) and to ship it offsite as radioactive waste for disposal Cleanup operations were completed by 1975, and the triangle area has not been used since that time to store radioactive materials (Owen 1973). The radiometric survey should have identified any areas with radioactivity above background levels, and any material found should have been cleaned up, packaged, and shipped offsite to a DOE disposal facility.

CERCLA Finding - Remedial action completed; verification will be made under CEARP Phase V; therefore, a CERCLA finding for FFSDIF, PA, and PSI is not appropriate, nor is HRS and MHRS Migration Mode scoring.

Planned Future Action - The radiometric survey data will be compiled by CEARP and used to verify and to document the adequacy of the remedial action. In addition, steps will be taken to identify and plan for any continuing monitoring requirements needed to demonstrate control of any potential migration or to recognize future problems adequately. Based on the results of these data, appropriate action will be taken.

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V.A.3. Sites with Possible Radioactive/Hazardous Chemical Waste of Contamination. Table V-3 lists potential CERCLA sites at the plant that are known or suspected to have both radioactive and hazardous chemical waste or contamination. These sites are discussed in the same order as they are listed in Table V-3.

V.A.l.a. Original Process Waste Lines. All Areas. A new process waste line system was installed in the late 1970s, and the old system was flushed, sealed, and left in place. The original system contains limited quantities of uranium and plutonium. When operational, the original system carried an aqueous radioactive/chemical waste (sometimes acidic and sometimes basic). Materials in the environment from leaks in this system could include radioisotopes, metallic ions, sodium, potassium, sulfates, and nitrates.

CERCLA Finding - Positive for FFSDIF, PA, and PSI; however, there is not sufficient information to calculate HRS and MHRS Migration Mode Scores.

Planned Future Action - A CEARP Phase I reconnaissance field study will be conducted to determine the presence or absence of hazardous substances and radionuclide concentrations both in and adjacent to the line. The potential for migration into various environmental pathways will be evaluated. Based on the results of these data, appropriate action will be taken.

Y.A.3.b. Original Landfill. Original Plant Site Outside the Security-Fenced Area. The original (south) onsite landfill is located south of the security-fenced area but inside the original plant site. This landfill measures approximately 124 x 400 ft and has an estimated volume of 2 million ft³. It was used from 1952 to 1968 to dispose of general plant wastes and is known to contain about 44 lbs of depleted uranium ash (Owen 1973). Persons interviewed mentioned that this landfill may have received nonradioactive hazardous chemical waste generated at the plant, including solvents. Some of the people interviewed mentioned that an old graphite dump was located south of Building 440, and that this dump may have received beryllium and/or uranium. The site of the dump is actually this original landfill (PC 1985c).

No detailed information on the contents of this landfill is available.

CERCLA Finding - Positive for FFSDIF, PA, and PSI; HRS Migration Mode Score 15; MHRS Migration Mode Score 5 (Appendix B).

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lable V.S. Potential CIRCLA Sites identified During CIASP Phase ; with Peasible Radiosctive/Rezardens Chemical Wests or Centemination

Unit Lines (oll areas) Original Landfill (OPS)	Inaccion/	Paltiva	ž ' <u>.</u>	finding keers keers	EN CERCA France Closest	GARZIGINA ^E Street Please
	Compa		!	l	l	(Ness I, Supplemental)
	Inective/ Course	Paltis	\$	*		Confirmation (Phase 11)
Prosent Landfill (OPS)	Activa/ Inactiva	Pasition	*	•	Remedial Immetigation	Confirmation (Phone 11)
	Inactive/ Course	3111	4	•	•	Confirmation (Place 11)
_	Inective/ Covered	Paltis	~	•	i	Confirmation (Phase 11)
Trench T-3 (998 Area)	Inective/ Coverse	Patrix	=	•	1	Condimetion (Phase II)
frenches T 4 to T-11 (980 Area)	Inactiva/ Covered	Paltin	4	•	i	Confirmation (Phase 11)
207 Salar Evaporation Frank (900 Arm)	Activa	Palitive	3		imediation	Candination (Place 11)
fetentian Park (GT/Buller Zana)	Activa	Meertein	¥	*	i	installation Assessment (Place I. Supplemental)
Cooling Tower Pends (468 Area)	Inactiva/ Congres	Pesitive	2	¥	•	Condimetion (Phase 11)

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Table V.S. Petential CRCLA Bitse identified buring CLARP Phase in with Presible Radiosctive/Bezardeus Chapical Wate or Contamination (cm.)

	Confirmation (Phase 11) Confirmation (Phase 11) Installation Assessment (Phase 1, Supplemental) Compliance and Verification (Phase 1, Supplemental) Installation Assessment (Phase 1, Supplemental)				Patitive Pat	
	Installation Assessment (Place 1, Eugelemental) Installation Assessment	.	u u	* *	Pealette Valette	į į
iquid typili resitive M M M M M M M M M M M M M M M M M M M	Compiliance and Verification (Phase V)	I	1	•	'n	į
	Installation Assessment (Phase I, Supplemental)	i	¥	¥	Pealtive	Inective
politics Positive M.	Installation Associated (Phose 1, Supplemental)	1	¥	¥	Patrix	Inacci (va) Classed
Cleaned Pealtive HE HE HE HERE Insective Pealtive HE HE HERE Insective HERE In	Confirmation (Phase 11)	Ē	-	æ	Pettin	Institut
inactive Politice 26 1 Lincolne Politice 26 26 1 Lincolne Politice 26 26 26 26 26 26 26 26 26 26 26 26 26	GARLICEGAS Street Phone				Findion	State

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Table V.3. Petential CERCLA Sites identified During CEARP Phase in with Possible Redisective/Mazardous Chemical Mests of Cantamination (can)

HE HOTE HE			30 304	POE CEARP Phose I	1	İ	Plenned Future Action
Lock	Site	Stetue	ffsbif/PA/Psi ^a findina	MRS ^D Score		EPA CERCLA Program Element	DOE CEAR/CERCLA ^E Order Phase
fires) Look Look Positive NE	Process Meste Leaks (808 Ares)	ij	1	1	1	Mane	Compliance and Verification (Phase V)
ideal location footities in	Effluent Pipe Break (780 Area)	1	1	1	1	Hora	Compliance and Verification (Phase V)
Inactive, Positive RE RE Bone Inactive Positive RE RE Bone Duilt Coar Positive RE RE Bone Managered RA RE RE Bone Managered RA RE ROM Managered RA RA RE ROM Managered RA RA RA RAN Managered RA RA RAN Managered RA RA RAN Managered RA RAN Managered RAN	Lou-Level Radioactive Maste Loak (980 Area)	1	Pasitiva	¥	¥	<u>\$</u>	Installation Assessment (Phase I, Supplemental)
Inactive Positive K K K K Nore Inactive/ Positive K K K Nore List Spill M M M M M M M M M M M M M M M M M M	Ach Pite (OPS)	Inactive/ Covered	Pasteive	¥	¥	More	Installation Assessment (Phose I, Supplemental)
Inactive/ Positive ME ME ME MODE built Cour	Old Outfall (700 Area)	Inactive	Positive	¥	¥	Por	Installation Assessment (Phose I, Supplemental)
inective Positive is income in the second in	011 Burn P1c Ho. 1 (300 Area)	Inactive/ Built Over	Pasitive	¥	¥	ě	Installation Assessment (Phase I, Supplemental)
Inactive NE NE None None None None None None None None	011 Burn P11 Bo. 2 (960 Area)	A Constitution of the Cons	1	£	¥	eg .	Compliance and Verification (Phase V)
apili na ka ka	Sludge Dispersal (998 Area)	Inactive	Positive	¥	¥	Hone	Instellation Assessment (Phose 1, Supsignants)
	Weste Spills (100 Ares)	11946	í	1	\$	i	Compilance and Verification (Phase V)

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Table V.3. Petential CERCLA Sites identified During CEARP Phase I with Possible Redisscrive/Rezardous Chemical Vests or Contamination (con.)

		DOE CEAST Phose I	Phose I			•
5116	Status	FFSOIF/PA/PSI		Kore	EPA CERCLA Program Element	Flammed Future Action DOE CEARP/CERCIA [©] Order Whee
Sanitory Weste Line Louk (800 Ares)	į	Positive	¥	¥	e d	Installation Assessment
Undergreemd Concrete Tanks (400 Area)	Inective	Positive	¥	¥	Hone	Installation Assessment
Pailot Burn Site (900 Area)	1	£	s	á	5	(Phase I, Supplemental) Compliance and Verification
						(Phase V)

federal facility Site Discovery and Identification findings/Preliminary Assessments/Preliminary Site Inspections BPA Mezerd Ranking System/DOE Modified Mezerd Ranking System

Comprehensive Environmental Assessment and Response Prograw/Comprehensive Environmental Response, Compensation, and Liability Act dot Applicable Not Eveluated

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Planned Future Action - This site will be evaluated under CEARP Phase II to determine whether further action is warranted under CEARP Phase III

V.A.3.c. Present Landfill. Original Plant Site Outside the Security Fenced Area. The present (north) onsite landfill is located 900 ft north of the security-fenced area on the north side of the plant within the original plant site. The original portion of this landfill was placed in service in 1968. In 1974, a major expansion was undertaken (Zeff 1974), including soil investigations to determine the content and extent of groundwater contamination (see the plant EIS for details (RFEIS 1980))

An estimated 9 million lbs of waste is disposed of annually at this onsite landfill Persons interviewed mentioned that this landfill may have received chromates, electro-discharge machining (EDM) fluid (a liquid similar to kerosene), solvents, several small strontium calibration sources, and small amounts of organic chemicals. In March 1985, personnel from a subcontractor were found dumping paint, paint thinner, and paint remover into this landfill (PC 1985b). Records show that this landfill received about 2,200 lbs of sanitary sewage sludge between 1968 and 1970 (suspect for heavy metals and radioactivity), and that leachate from this landfill contained both tritium and long-lived alpha (RFEIS 1980). Leachate from the landfill is collected in a small pond and was spray irrigated to the north and east of the landfill area from about 1968 to 1974. Since that time it has been spray irrigated to the south and west. Current monitoring data show that neither tritium nor long-lived alpha exceeds background levels in the pond (Owen 1973, RFEIS 1980, AEMR 1983 to 1985).

CERCLA Finding - Positive for FFSDIF, PA, and PSI, HRS Migration Mode Score 34; MHRS Migration Mode Score 5 (Appendix B).

Planned Future Action - This site will be evaluated under CEARP Phase II to determine whether future action is warranted under CEARP Phase III.

V.A.3.d. Trench T-1. 900 Area. Trench T-1, a burish trench, is located just north of Central Avenue and immediately west of the East Guard Gate. It was used from 1952 until 1962 and contains 125 drums filled with depleted uranium chips coated with small amounts of lathe coolant (a mixture of about 70% hydraulic oil and 30% carbon tetrachloride). This trench was covered with about 2 ft of soil, and the corners of the trench were marked (Owen 1973). However, two drums were uncovered when

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weeds were being cut in 1982, and one drum contained an oily sludge with 43 picocuries per gram of plutonium and 12 microcuries per gram of uranium (PC 1985c).

CERCLA Finding - Positive for FFSDIF, PA, and PSI, HRS Migration Mode Score 17, MHRS Migration Mode Score 6 (Appendix B),

Planned Future Action - This site will be evaluated under CEARP Phase II to determine whether future action is warranted under CEARP Phase III.

V.A.J.e. Trench T-2. 900 Area. Trench T-2 is located south of the 903 drum storage area and west of the reactive metal destruction site within the 900 Area This trench measures about 50 x 300 ft and was used prior to 1968 for the disposal of sanitary sewage sludge, and flattened drums contaminated with uranium and plutonium (Owen 1973)

CERCLA Finding - Positive for FFSDIF, PA, and PSI, HRS Migration Mode Score 17; MHRS Migration Mode Score 6 (Appendix B).

Planned Future Action - This site will be evaluated under CEARP Phase II to determine whether future action is warranted under CEARP Phase IIL

V.A.3.f. Trench T-3. Original Plant Site Outside the Security-Fenced Area. Trench T-3 is located just east of the East Access Gate (Gate 9) outside the security fence. This trench measures about 50 x 300 ft and was used prior to 1968 for the disposal of flattened drums contaminated with uranium and plutonium. This trench also received substantial quantities of sanitary sewage sludge (Owen 1973).

CERCLA Finding - Positive for FFSDIF, PA, and PSI; HRS Migration Mode Score 17, MHRS Migration Mode Score 6 (Appendix B).

Planned Future Action - This site will be evaluated under CEARP Phase II to determine whether future action is warranted under CEARP Phase IIL

V.A.3.e. Trenches T-4 to T-11. Original Plant Site Outside the Security-Fenced Area. Trenches T-4 through T-11 are all located just east of the East Access Gate (Gate 9) outside the security fence. These trenches, approximately 50 x 300 ft, were used from 1954 to 1968 for the disposal of flattened drums contaminated with uranium and plutonium. Activity ranges from \$00 to \$,000 dpm/g. Trenches T-4 and T-

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Il also contain some uranium/plutonium-contaminated asphalt planking from the solar evaporation ponds and quantities of sanitary sewage sludge (Owen 1973)

CERCLA Finding - Positive for FFSDIF, PA, and PSI, HRS Migration Mode Score 17, MHRS Migration Mode Score 6 (Appendix B)

Planned Future Action - The trenches will be evaluated under CEARP Phase II to determine whether future action is warranted under CEARP Phase III.

V.A.3.h. 207 Solar Evaporation Ponds, 900 Area. The 207 solar evaporation ponds, located in the northern part of the 900 Area, were constructed over an extended period, beginning in the mid-1950s to hold effluents from treated process waster that were high in nitrates. Originally, the solar evaporation ponds were a couple of claylined ponds near Building 779 to hold efficient (mostly water) that remained after processing liquid wastes in Building 774. The effluent from treating acid wastes was thick with aluminum hydroxide and difficult to filter; therefore, this efficent was solidified with cement and shipped offsite for disposal or held in the ponds. Pond A was constructed and lined with planking and asphalt to hold this effluent (high in nitrates) prior to its being processed and shipped. The bottom of pond A buckled and the pond leaked. Therefore, the three B ponds (B-North, B-Center, and B-South) were constructed during 1960 and lined with apphalt cement over the planking. On hot days, the asphalt cement would slide, crack, and leak. An attempt was made to mend these leaks using Mastick (trademark), burlap, asphalt, and Phillips Petromat (trademark). However, cracks developed under the northeast corner of pond B-North After an especially wet winter and spring, the A pond and the three B ponds were full, therefore, pond C was constructed in 1970 Pond C was constructed over the original clay-lined ponds.

Over time, these ponds received sanitary sewage sludge, radioactive liquid wastes from the beagle dog studies done at Colorado State University, lithium metal, and various liquids. As recently as December 1983, pond A received chemicals including sodium nitrate, ferric chloride, lithium chloride, sulfuric acid, and ammonium persulfate (PC 1985b). However, oils and solvents have been kept out of the pends to prevent surface scum that would hamper evaporation.

Leachate (high in nitrates and other contaminants) from the leaking solar ponds contaminated shallow groundwater. To prevent this contaminated groundwater from dis-

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charging into the North Walnut Creek drainage, a groundwater interceptor system was installed in 1970. Water collected by this system is returned to the ponds. As part of the NPDES permit process in 1982, a set of samples from the hillside interceptor system was collected and analyzed for the priority pollutants and other specified metals. Cadmium, lead, nickel, selenium, thallium, chloroform, and trichloroethylene were detected. The system is now routinely monitored for these seven pollutants.

During the 1980s, sludge was removed from the B ponds. Cleanup of pond A started in 1985. Because pond C has not been known to leak during normal operation, it has been retained in semi-active status for use on a demand basis (Owen 1973, PC 1985b).

Steep hillsides surrounding the plant are known to slump when saturated with water. Because these ponds are located adjacent to the North Walnut Creek drainage, slumping could occur, causing damage to the ponds and releasing liquid. A high priority item is to eliminate the ponds.

CERCLA Finding - Positive for FFSDIF, PA, and PSI, HRS Migration Mode Score 46; MHRS Migration Mode Score 7 (Appendix B).

Planned Future Action - Rocky Flats Plant is currently removing sludge from the bottom of pond A. A site characterization study will be performed under CEARP Phase II. All cleanup activities, monitoring data, and reconnaissance data will be reviewed under CEARP to determine what future actions may be warranted.

VA.3.i. Retention Ponds (A.B.C Series). Original Plant Site Outside the Security-Fenced Area and the Buffer Zone. There are three series of retention ponds (A, B, and C) on North Walnut Creek, South Walnut Creek, and Woman Creek (respectively). These ponds are located outside the security-fenced area, and, except for the final pond on each series, are within the original plant boundary. The retention ponds are used primarily to capture and control surface water runoff to allow sampling and analysis to be done prior to reuse or release of the water downstream. Prior to 1979, some of the ponds were used to hold various wastes that contained nitrates and low levels of radioactivity. Water from the ponds was periodically discharged under NPDES permitand DOE- (or its predecessor) radioactivity limits in effect at that time. Extensive efforts have been made to reduce the amount of water discharged from the plant site. For example, in 1983, water was discharged on four days only and that was dependent upon

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precipitation (AEMR 1984, RFEIS 1980) Data are needed to determine whether hazardous substances occur in the pond sediments

CERCLA Finding - Uncertain for FFSDIF, PA, and PSI, there is not sufficient information to calculate HRS and MHRS Migration Mode Scores.

Planned Future Action - A CEARP Phase I reconnaissance field study will be conducted to determine the presence or absence of hazardous substances and the potential for migration into various environmental pathways. Based on the results of this study, appropriate action will be taken.

V.A.3.i. Cooling Tower Ponds (3), 400 Area. There were three cooling tower blowdown ponds (containing chromates and algicides) located near Building 444. One pond measured about 30 x 100 ft; the other two measured about 25 x 75 ft. These ponds were also used on occasion to destroy lithium metal (Owen 1973). The ponds were covered with fill and may have been used to bury small amounts of depleted uranium (Owen 1973). The amount of hazardous substances that remain in the environment at this area is unknown.

CERCLA Finding - Positive for FFSDIF, PA, and PSI; HRS Migration Mode Score
12. MHRS Migration Mode Score not evaluated because of insufficient information

Planned Future Action - The radiometric survey data will be compiled by CEARP These data will be used to evaluate the current status of these sites. If warranted, a CEARP reconnaissance field study will be conducted to determine the presence or absence of residual radioactivity and the potential for migration into various environmental pathways. Based on the results of these data, appropriate action will be taken.

VA3.k. 903 Drum Storage Area. 900 Area. The 903 drum storage area, located south of Central Avenue, contained about 5,240 drums of spent machine cutting oil (lathe coolant, a mixture of about 70% hydraulic oil and 30% carbon tetrachloride). Approximately 3,570 of these drums contained plutonium. Between 1967 and 1968, all the drums were removed, the liquid was solidified, everything was repackaged, and all material was shipped offsite to 2 DOE disposal facility. After the drums were removed, efforts were undertaken to scrape and move the plutonium contaminated soil into a relatively small area, cover it with fill material, and top it with an asphalt containment cover. This work was completed in November 1969. Some measurements in 1970 indicated that

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an estimated 11.4 Ci of plutonium leaked into the soil before the drums were removed, most of which (about 8.6 Ci) remained onsite (RFEIS 1980). It is also estimated that about 1.7 Ci of plutonium was under the asphalt pad. (Owen 1973, Krey 1975). The remaining plutonium was carried offsite (Sec. V A.5.a). Plutonium remains in the soil under the asphalt pad. Mineral oil and solvents may remain in the soil from leaking lathe coolant.

CERCLA Finding - Positive for FFSDIF, PA, and PSI, HRS Migration Mode Score 26; MHRS Migration Mode Score 1 (Appendix B)

Planned Future Action - This site will be evaluated under CEARP Phase II to determine whether future action is warranted under CEARP Phase III.

V.A.3.1. Mound Area. 900 Area. The mound area, located near the East Guard Gate, contained 1,405 drums filled with depleted uranium and beryllium wastes. The wastes were mostly solid, however, some drums were filled with lathe coolant (a mixture of about 70% hydraulic oil and 30% carbon tetrachloride). Cleanup of the mound area was achieved in 1970, and the materials removed were packaged and shipped offsite as radioactive waste. Subsequent soil sampling in the vicinity of the excavated mound area indicated 0.8 to 112.5 dpm/g alpha activity. This radioactive contamination was thought to have come from the 903 drum storage area rather than from the mound area (Owen 1973).

A limited quantity of mineral oil and solvents, along with the alpha contamination, may remain in the soil from leaking lathe coolant.

CERCLA Finding - Positive for FFSDIF, PA, and PSI, however, there is not sufficient information to calculate HRS and MHRS Migration Mode Scores.

Planned Future Action - A CEARP Phase I reconnaissance field study will be conducted to determine the presence or absence of hazardous substances and the potential for migration into various environmental pathways. Based on the results of this study, appropriate action will be taken.

<u>V.A.3.m.</u> Out-of-Service Process Waste Tanks. 700 Area. Out-of-service process waste tanks exist north of Building 771. These tanks have been disconnected from their respective source systems and periodically full with groundwater that has to be

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pumped into the new process waste system. Information from the intethat these tanks may have leaked process waste while in use

CERCLA Finding - Positive for FFSDIF, PA, and PSI, however there ... not the cient information to calculate HRS and MHRS Migration Mode Scores

Planned Future Action - The tanks will be included in the onsite tank inventory (Sec VB6d) A CEARP Phase I reconnaissance field study will be conducted to determine the presence or absence of residual radioactivity and the potential for migration into various environmental pathways. Based on the results of this study, appropriate action will be taken.

V.A.3.n. Concrete Process Waste Tanks, 700 Area. From the late 1950s until 1970, six concrete tanks located east of Building 774 were used to hold process wastes. The process wastes were an aqueous solution with plutonium, uranium, acids, and caustics. These tanks frequently overflowed, and one overflow in the late 1950s flowed down the road toward Walnut Creek (Owen 1973). These tanks were removed in the early 1970s. Details on the amount of decontamination were not found in the literature.

Nonradioactive materials, primarily sodium, potassium, sulfur, and nitrates, introduced into the environment from leaks in these tanks may no longer be detectable Residual surface radioactive contamination should have been removed during the radiometric survey

CERCLA Finding - Remedial action completed; verification will be made under CEARP Phase V; therefore, a CERCLA finding for FFSDIF, PA, and PSI is not appropriate, nor is HRS and MHRS Migration Mode accring.

Planned Future Action - Steps will be taken to identify and plan for any continuing monitoring requirements needed to demonstrate control of any potential migration or to recognize future problems adequately. Appropriate action will be taken as necessary

V.A.3.o. Radioactive Liquid Waste Storage Tanks. 700 Area. Persons interviewed mentioned that one large overflow occurred at the radioactive liquid waste storage tanks located south of Building 774 (probably the pipe break that occurred in the late 1970s). The liquid-containing plutonium, americium, and possibly uranium-flowed toward the front of the building. This overflow was immediately cleaned up.

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Another spill of process waste occurred at Building 774 in July 1981 material dried, radiological measurements of the area indicated no ## above background (PC 1985b). Nonradioactive materials introduced ato the from these overflows or spills may no longer be detectable. Although varface ity above background was removed during the radiometric survey, the amount of alona contamination remaining in the subsurface soil around the tanks is unknown.

CERCLA Finding - Positive for FFSDIF, PA, and PSI, however, there is not sufficient information to calculate HRS and MHRS Migration Mode Scores.

Planned Future Action - The tanks will be included in the onsite tank inventory (Sec. V B 6 d). A CEARP Phase I reconnaissance field study will be conducted to determine the presence or absence of hazardous substances and the potential for migration into various environmental pathways. Based on the results of this study, appropriate action will be taken.

V.A.3.p. Holding Tanks, 700 Area. Some of those interviewed mentioned that in the early 1980s, tank #66 (an underground cement holding tank for radioactive liquid waste) overflowed. This overflow (about 50 to 100 gal) was high in nitrates and contained plutonium and uranium. They also mentioned that the area has since been paved over; however, they were not sure how much material was cleaned up prior to DEVIDE

Although surface radioactivity above background was removed during the radiometric survey, the amount of alpha contamination remaining under the pavement is unknown. Nonradioactive materials introduced into the environment from this overflow may no longer be detectable.

CERCLA Finding - Positive for FFSDIF, PA, and PSI; however, there is not sufficient information to calculate HRS and MHRS Migration Mode Scores.

Planned Future Action - The tanks will be included in the onsite tank inventory (Sec. V.B.6 d). A CEARP Phase I reconnaissance field study will be conducted to determine the presence or absence of hazardous substances and the potential for migration into various environmental pathways. Based on the results of this study, appropriate action will be taken.

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V.A.3.a. Valve Vault 7, 700 Area Persons interviewed that sometime prior to 1973, valve vault 7 controlling the 800 Complex main line, located on Sage Avenue, overflowed. The liquid flowed along the remouth is Building 707. They said they believed this liquid could have contained granium, organicils, beryllium, nitric acid, hydrochloric acid, and fluorides. The valve vault was replaced in March of 1973. There have been other overflows, the most recent occurred in April 1983 (PC 1985a).

Most of the nonradioactive materials introduced into the environment from these overflows may no longer be detectable. Surface radioactivity above background should have been removed during the radiometric survey.

CERCLA Finding - Positive for FFSDIF, PA, and PSI; however, there is not sufficient information to calculate HRS or MHRS scores

Planned Future Action. A CEARP Phase I reconnaissance field study will be conducted to determine the presence or absence of hazardous substances and the potential for migration into various environmental pathways. Based on the results of this study, appropriate action will be taken.

V.A.3.r. Sewer Line Break. 700 Area. Some of the people interviewed mentioned that the sanitary sewer line broke somewhere between Buildings 779 and 777, and that this break resulted in some low-level radioactive contamination of the hillside. The only radioactive material carried in sewer lines was the laundry effluent from about 1969 to 1973. The hillside is about 500 ft north of this location.

The materials introduced into the environment from this sewer line break (mostly water containing sanitary wastes and laundry wastes) may no longer be detectable except for radioisotopes. Surface radioactivity above background should have been removed during the radiometric survey at the plant.

CERCLA Finding - Positive for FFSDIF, PA, and PSI; however, there is not sufficient information to calculate HRS or MHRS scores.

Planned Future Action - A CEARP Phase I reconnaissance field study will be conducted to determine the presence or absence of hazardous substances and the potential for

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migration into various environmental pathways. Based on the results of spropriate action will be taken.

V.A.3.1. Radioactive Liquid Leaks (8), 700 Area. In interviews, some people mentioned eight locations outside of buildings that received radioactive contamination from spills or leaks. Most of this contamination was liquid process waste (a radioactive, liquid mixed waste containing caustics or acids), and the areas were subsequently decontaminated. No environmental hazard should remain. Additionally, surface radioactivity above background should have been removed during the radiometric survey.

CERCLA Finding - Remedial action completed; verification will be made under CEARP Phase V; therefore, a CERCLA finding for FFSDIF, PA, and PSI is not appropriate, nor is HRS and MHRS Migration Mode scoring.

Planned Future Action - Reconnaissance data will be collected as part of CEARP Phase V to verify and document the adequacy of the remedial action. In addition, steps will be taken to identify and plan for any continuing monitoring requirements needed to demonstrate control of any potential migration or to recognize future problems adequately.

V.A.3.t. Process Waste Leaks, 800 Area. Persons interviewed mentioned that low-level radioactive contamination exists north of Building 881 from leaks in the process waste lines. In addition, in January 1978, a few gallons of process waste was spilled near the 865 guard post. This area was immediately cleaned, and a survey did not detect radioactivity above background levels (PC 1985c). No environmental hazard should remain. Additionally, surface radioactivity above background should have been removed during the radiometric survey.

CERCLA Finding - Remedial action completed; verification will be made under CEARP Phase V; therefore, a CERCLA finding for FFSDIF, PA, and PSI is not appropriate, nor is HRS and MHRS Migration Mode scoring.

Planned Future Action - Reconnaissance data will be collected as part of CEARP Phase V to verify and document the adequacy of the remedial action. In addition, steps will be taken to identify and plan for any continuing monitoring requirements needed to demonstrate control of any potential migration or to recognize future problems adequately.

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V.A.J.u. Efsluent Pipe, 700 Area Persons

tioned that prior to beginning evaporation operations in Building 374, the and ent pipe from Building 774 to the 207 solar evaporation ponds separated and leaked. These evaporation operations started in 1980 and now evaporate the effluent from Building 774 Since the start of operations in Building 374, this pipe has not been used. Materials introduced into the environment from this leaking pipe damaged the vegetation in localized areas. This area was cleaned up and no current visual evidence of this leak exists. The pipe carried a radioactive aqueous solution with caustics or acids. The natural buffering action of the soil would have neutralized these caustics or acids, and no environmental hazard should remain. Additionally, surface radioactivity above background should have been removed during the radiometric survey

CERCLA Finding - Remedial action completed; verification will be made under CEARP Phase V; therefore, a CERCLA finding for FFSDIF, PA, and PSI is not appropriate, nor is HRS and MHRS Migration Mode scoring.

Planned Future Action - Reconnaissance data will be collected as part of CEARP Phase V to verify and document the adequacy of the remedial action. In addition, steps will be taken to identify and plan for any continuing monitoring requirements needed to demonstrate control of any potential migration or to recognize future problems adequately

V.A.3.v. Low-Level Radioactive Waste Leak, 900 Area. Some people interviewed mentioned that, during some construction activities, the low-level waste discharge line between Building 995 and Building 774 had been severed several times Materials introduced into the environment from these leaks may be masked by the releases from the 207 solar evaporation ponds. The low-level waste line carried an aqueous waste high in nitrates with small amounts of plutonium.

CERCLA Finding - Positive for FFSDIF, PA, and PSI; however, there is not sufficient information to calculate HRS and MHRS Migration Mode Scores.

Planned Future Action - The additional studies planned for the 207 solar evaporation ponds (Sec. V A.3 h) will encompass potential contamination from these releases. A CEARP Phase I reconnaissance field study will be conducted to determine the presence or

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absence of hazardous substances and the potential for migration into var environmental pathways. Based on the results of this study, appropriate action will be aken

V.A.3.w. Ash Pits. Original Plant Site Outside the Security-Fenced Area. Prior to the early 1960s, an incinerator was located along the west access road near the plant's original west boundary. This was a small incinerator (firebox with a 10 to 20 ft stack) used to burn office-type wastes. People also mentioned in interviews that depleted uranium chips were burned in this incinerator. The ashes were either put into pits (located adjacent to the incinerator) or were pushed over the side of the hill next to the incinerator into the Woman Creek drainage. Incineration was discontinued and the incinerator was demolished in the early 1960s. The ash pits were covered with fill. The types and amounts of hazardous substances that may remain at this site are unknown

CERCLA Finding - Positive for FFSDIF, PA, and PSI, however, there is not sufficient information to calculate HRS and MHRS Migration Mode Scores.

Planned Future Action - A CEARP Phase I reconnaissance field study will be conducted to determine the presence or absence of hazardous substances and the potential for migration into various environmental pathways. Based on the results of this study, appropriate action will be taken.

<u>V.A.3.z.</u> Old Outfail. 700 Area. Persons interviewed mentioned that some process or laundry waste lines from Building 771 drained into the Walnut Creek outfall for the first couple of years of building operations. The exact time is unknown, however, it would have been in the mid-1950s.

The materials introduced into the environment from these waste lines (sodium, potassium, sulfates and nitrates) would no longer be detectable, with the possible exception of radioisotopes. However, because the process waste was not well characterized in early operations, additional data are needed to determine if other residual nonradioactive hazardous substances remain in the environment at this location. Radiological monitoring of selected locations on this stream channel is performed annually, and these data do not indicate levels of radioisotopes above applicable standards (AEMR 1974 through AEMR 1985).

CERCLA Finding - Positive for FFSDIF, PA, and PSI; however, there is not sufficient information to calculate HRS and MHRS Migration Mode Scores.

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Planned Future Action - A CEARP Phase I reconnaissance field study will conducted to determine the presence or absence of hazardous substances and the potential for migration into various environmental pathways. Based on the results of this study appropriate action will be taken

V.A.3.v. Oil Burn Pit Number 1, 300 Area Building 335 is constructed over oil burn pit number 1 and a lithium metal destruction site. This pit was used in 1956 to burn oil containing depleted uranium. It contained residual by-products from burning operations and was covered with soil (Owen 1973)

CERCLA Finding - Positive for FFSDIF, PA, and PSI, however, there is not sufficient information to calculate HRS and MHRS Migration Mode Scores.

Planned Future Action - A CEARP Phase I reconnaissance field study will be conducted to determine the presence or absence of hazardous substances and the potential for migration into various environmental pathways. Based on the results of this study, appropriate action will be taken

<u>V.A.3.z.</u> Oil Burn Pit Number 2, 900 Area. Oil burn pit number 2 was located close to the mound area north of the 903 drum storage area. This pit was used in 1957 and from 1961-1965 to burn approximately 1,083 drums of oil containing uranium. The residues from the burning operations and some flattened drums were covered with backfill. The pit was subsequently cleaned up and removed during the 1970s. Cleanup operations required the excavation of a hole approximately 5 ft deep (Owen 1973).

CERCLA Finding - Remedial action completed; verification will be made under CEARP Phase V, therefore, a CERCLA finding for FFSDIF, PA, and PSI is not appropriate, nor is HRS and MHRS Migration Mode scoring.

Planned Future Action - Reconnaissance data will be collected as part of CEARP Phase V to verify and document the adequacy of the remedial action. In addition, steps will be taken to identify and plan for any continuing monitoring requirements needed to demonstrate control of any potential migration or to recognize future problems adequately.

V.A.3.aa. Sludge Dispersal, 900 Area. The sludge from the sengent treatment plant is collected in drying beds and, once dried, is packaged and shapes offsite for disposal as radioactive waste. The only radioactive material the entered the sewage treatment plant was radioactive laundry effluent from about 1969 to 1973. Prior to 1983, some of the dried sludge became airborne and was dispersed around the drying beds and on both sides of the perimeter road east of Building 995 during packaging operations. Those operations are now conducted in an enclosure. Concentrations of residual hazardous substances introduced to the environment from this windblown sludge are unknown.

CERCLA Finding - Positive for FFSDIF, PA, and PSI; however, there is not sufficient information to calculate HRS and MHRS Migration Mode Scores.

Planned Future Action - A CEARP Phase I reconnaissance field study will be conducted to determine the presence or absence of hazardous substances and the potential for migration into various environmental pathways. Based on the results of this study, appropriate action will be taken.

V.A.3.bb. Waste Spills. 100 Area. Persons interviewed mentioned that several small spills of nitrate wastes occurred around the outside of Building 123. These wastes may have contained radionuclides. The nitrates introduced into the environment from these small spills would probably not be detectable. The radiometric survey should have identified any areas with radioactivity above background levels, and any material found should have been cleaned up, packaged, and shipped offsite to a DOE disposal facility.

CERCLA Finding - Remedial action completed, verification will be made under CEARP Phase V, therefore, a CERCLA finding for FFSDIF, PA, and PSI is not appropriate, nor is HRS and MHRS Migration Mode scoring.

Planned Future Action - The radiometric survey data will be completed by CEARP and used to verify and to document the adequacy of the remedial action. In addition, steps will be taken to identify and plan for any continuing monitoring requirements needed to demonstrate control of any potential migration or to recognize future problems adequately. Based on the results of these data, appropriate action will be taken.

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V.A.3.cc. Sanitary Waste Line Leak, 800 Area in January 19 he sanitary waste line located south of Building 881 leaked. The waste line was roled, and an earthen dike was placed to prevent seepage into the south interceptor ditch (PC 1985b). The only radioactive material that entered the sanitary sewer system was radioactive laundry effluent from about 1969 to 1973. Whether hazardous substances exist at this site is unknown.

CERCLA Finding - Positive for FFSDIF, PA, and PSI, however, there is not sufficient information to calculate HRS and MHRS Migration Mode Scores

Planned Future Action - A CEARP Phase I reconnaissance field study will be conducted to determine the presence or absence of hazardous substances and the potential for migration into various environmental pathways. Based on the results of this study, appropriate action will be taken

V.A.3.dd. Underground Concrete Tanks, 400 Area. There are several underground concrete tanks located south of Building 441 that contained nitrates and possibly radionuclides. Persons interviewed mentioned that these tanks may have leaked. They were part of the original process waste system and have not been removed

CERCLA Finding - Positive for FFSDIF, PA, and PSI, however, there is not sufficient information to calculate HRS and MHRS Migration Mode Scores

Planned Future Action - These tanks will be included in the onsite tank inventory (Sec VB6d) A CEARP Phase I reconnaissance field study will be conducted to determine the presence or absence of hazardous substances and the potential for migration into various environmental pathways. Based on the results of this study, appropriate action will be taken.

V.A.3.ee. Pallet Burn Site. 900 Area. Some of those interviewed said that in 1965, an area southwest of oil burn pit number 2 was used to destroy wooden pallets. The types of hazardous substances or radionuclides that may have been spilled on these pallets is unknown. This site was removed in the 1970s.

CERCLA Finding - Remedial action completed; verification will be made under CEARP Phase V; therefore, a CERCLA finding for FFSDIF, PA, and PSI is not appropriate, nor is HRS and MHRS Migration Mode scoring.

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Planned Future Action - The radiometric survey data will be compiled by $\xi = \Re P$ and used to verify and to document the adequacy of the remedial action. In adv. on, steps will be taken to identify and plan for any continuing monitoring requirements needed to demonstrate control of any potential migration or to recognize future problems adequately. Based on the results of these data, appropriate action will be taken

V.A.4. Sites with Possible Nonradioactive Hazardous Chemical Waste of Contamination Table V-4 lists potential CERCLA sites at the plant known or suspected to have nonradioactive hazardous waste or contamination. Because none of these sites contain radioisotopes, MHRS Migration Mode scoring is not applicable. These sites are discussed in the same order as they are listed in Table V-4.

V.A.4.a. Cooling Tower Blowdown, 300 Area Persons interviewed mentioned that the area immediately south of Building 374 received some cooling tower blowdown (containing chromates and algicides). The amount of these materials that may remain in the environment at this site is unknown.

CERCLA Finding - Positive for FFSDIF, PA, and PSI, however, there is not sufficient information to calculate a HRS Migration Mode Score

Planned Future Action - A CEARP Phase I reconnaissance field study will be conducted to determine the presence or absence of hazardous substances and the potential for migration into various environmental pathways. Based on the results of this study, appropriate action will be taken

V.A.4.b. Cooling Tower Blowdown. 700 Area. Persons interviewed mentioned that there was some cooling tower blowdown south of Building 774 that drained northward into North Walnut Creek. This water contained chromates and algicides. They probably referred to the cooling tower spill of about 400 gal that leaked into a storm drain near Building 779 in December 1976. Analysis of this spill indicated about 50 ppm total chromium in the water spilled (PC 1985b).

CERCLA Finding - Positive for FFSDIF, PA, and PSI; however, there is not sufficient information to calculate a HRS Migration Mode Score.

Planned Future Action - A CEARP Phase I reconnaissance field study will be conducted to determine the presence or absence of hazardous substances and the potential

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Table V 4. Petential CERCIA lites identified During CEARP Phase 1

		with Pessible Herri	diesetive i	ezardous Chemica	with Possible Henradioactive Hazardous Chemical Maste or Contenination	
		DOE CEARP Plese !	ARP Phose 3			Planned Future Action
		FESDIF/PA/PSI	e M	Mens b	EPA CENCLA	300
Site	Stetue	Finding	Score		Program Element	CEARP/CERCIAS Order Phase
Coeling Tower Bleadown (300 Area)	Insertive	Positive	W	'	Borne	Installation Assessment (Phase I, Supplemental)
Coeling Tower Blowdown (700 Ares)	Inactive	Positive	¥	s	Hone	installation Assessment (Phase I, Supplemental)
Milleide Off Leek (800 Ares)	Ĭ	Positive	¥	£	Book	Installation Assessment (Phase I, Supplemental)
Oil Leak (400 Area)	Ĩ	Positive	¥	1	8	Installation Assessment (Phase I, Supplemental)
Oli Sludge Pit (800 Area)	Inactive/ Covered	Positive	•	1	<u> </u>	Confirmation (Phase II)
Fuel 011 Leek (300 Area)	Ī	1	1	ĭ	§	Compliance and Verification (Phase V)
Fuel Oil Tank (600 Area)	<u>.</u>	1	1	1	Hone	Compliance and Verification (Phase V)
Lithium Metal Bostruction Site (300 Area)	Inactiva/ Built Over	Positive	•	1	Pos	Confirmation (Phase 11)
Reactive Matel Bestruction Site (908 Ares)	Inactive/ Covered	Pealtive	2	í	NOM	Confirmation (Phase II)
Chesical Storage (508 Area)	Inactive	Positive	¥	1	Hone	Installation Assessment (Phone 1, Supplemental)

		5 300	DOE CEARP Phase 1			Planned future Activity
		FFSD1F/PA/PSI	a SME	ned S b	EPA CERCLA	900
Site	Stettue	Finding	Score	E COC 4	Progres Elegan	CEARP/CERCIA ^C Order Phose
Fiberglameing Sites (2) (600 Arms)	Inactive	Positive	¥	á	ilore	Installation Assessment (Phase 1, Supplemental)
Liquid Bumping (800 Area).	Insettw	Positive	¥	1	ğ	Installation Assessment (Phase i, Supplemental)
Chemical Burial (800 Area) '	Inactive/ Covered	Positive	¥	1	Ē	Installation Assessment (Phase I, Supplemental)
Out 1811 (800 Areș)	Inactive	Positive	¥	s	Hone	Installation Assessment (Phase I, Supplemental)
Out of Service fuel Tents (808 Area)	Inactive/ Fitted	Positive	¥	\$	Bone	Installation Assessment (Phase I, Supplemental)
Acid Loaks (2) (400 Area)	<u>3</u>	Megative	á	1	e.o.	3
Acid Look (300 Area)	¥ .	Regative	ī	£	208	acca.
Multiple Acid Spills (800 Area).	11104	Begat i se	¥	i	Fore	Mone
Caustic/ Acid Spills (700 Ares)	3	Positive	¥	1	e Col	Installation Assessment (Phase 1, Supplemental)
Caustic Leak (400 Area)	į	Repetive	¥	1	Kone	Mone

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with Possible Amradioactive Mezardous Chapteel Wate or Contamination (can) Table V 4. Potential GBCLA Bites Identified Buring CEARP Phase ;

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शार	Stetue	FESSIF/PA/PSI MES	ZARE Prope 1	EM CRETA	Planned Future Action
Bydragen Perselds	į		Kera Kera	Crarte firms	CEARL/CERCIA [©] Order Phose
Spill (400 Area)		Megat i va	1	Rose	and the same of th
Multiple Solvant Spills (480 Arms)	Ī	Petrin	1	ŝ	
Autible Selvent Spills (700 Arms)	ě	Pasitiva	3		(Mose i. Supplementat)
Buttiple selvent Spills (980 Area)	Ī	Pairis	a W		Intititation Assessment (Phose I, Supplemental)
Antifress Bischarge (8PS)	Discharge	Popul i vo	1	1	Installation Assessment (Place 1, Supplemental)
Stom Conducate Lock (480 Arms)	i	Magant ive	1	i i	E
Stem Condensate Look (780 Area)	3	Beset ive	1		gen e
Hickel Carbanyl Dispused (GPE)	Inective/ Covered	Megaet i ve	1	i j	Eg.
Mare Sections Florid (80 Arms)	Inscilve	Pepel in	1	.	i i
Serup Metal Situm (2) (300 Arms)	l	Paget (ve	¥	i	į

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Table V.4. Potential CRECLA Sites identified Buring CRARP Place | with Possible Servediescrive Bezarders Chemical Waste or Centerination (con.)

Sice	finding	Kenta Kenta	ke in	EPA CERCIA Program Element	A CERCIA POR POR
VOCs in Leat Grandator	Pesicine	3	1	Production of the state of the	Centimation (Mass 11)

-federal facility site Discovery and Identification Findings/Proliminary Assessments/Proliminary Site Inspections EPA Staterd Ambing System/Add Sheef desking System

Comprehensive Environmental Assessment and Response Program/Comprehensive Environmental Desponse, Compusacion, and Liability Acc The Evaluated int Applicable

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for migration into various environmental pathways. Based on the results of this study, appropriate action will be taken

V.A.4.c. Hillside Oil Leak. 800 Area In 1973, there was an oil leak, believed to be from the fuel oil storage tanks (Sec VA40) on the hillside south of Building 881 Straw was used to limit the spread of the oil, and the oil-soaked straw and soil were removed and placed in the present onsite landfill (Owen 1973) The concentration of fuel oil residuals remaining in the environment at this site is unknown

CERCLA Finding - Positive for FFSDIF, PA, and PSI, however, there is not sufficient information to calculate a HRS Migration Mode Score.

Planned Future Action - A CEARP Phase I reconnaissance field study will be conducted to determine the presence or absence of hazardous substances and the potential for migration into various environmental pathways. Based on the results of this study, appropriate action will be taken

V.A.4.d. Oil Leak. 400 Area In November 1977, an underground oil leak was discovered near Building 443 (the steam plant). The leak was from a transfer pipe that was excavated and repaired. Oil has been periodically spilled in this area, and im July 1983, high groundwater forced oil out of the soil near this building (PC 1985b). The concentration of oil residuals remaining in the environment at this site is unknown.

CERCLA Finding - Positive for FFSDIF, PA, and PSI; however, there is not sufficient information to calculate a HRS Migration Mode Score

Planned Future Action - A CEARP Phase I reconnaissance field study will be conducted to determine the presence or absence of hazardous substances and the potential for migration into various environmental pathways. Based on the results of this study, appropriate action will be taken.

V.A.4.e. Oil Sludge Pit. 200 Area. In 1958, approximately 30 to 50 drums of oil sludge from cleaning storage tanks (Sec. V A 40) were emptied into a pit south of Building 881. The pit was covered with fill (Owen 1973). The concentration of fuel oil residuals remaining in the environment at this site is unknown.

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CERCLA Finding - Positive for FFSDIF, PA, and PSI, HRS Migration Mode Score 9 (Appendix B)

Planned Future Action - This site will be evaluated under CEARP Phase II to determine whether future action is warranted under CEARP Phase III

V.A.4.f. Fuel Oil Leak, 300 Area In August 1981, approximately 200 gal of fuel oil (#2 diesel) was spilled north of Building 374. The area was subsequently cleaned (PC 1985a)

CERCLA Finding - Remedial action completed, verification will be made under CEARP Phase V, therefore, a CERCLA finding for FFSDIF, PA, and PSI is not appropriate, nor is HRS Migration Mode scoring

Planned Future Action - Reconnaissance data will be collected as part of CEARP Phase V to verify and document the adequacy of the remedial action. In addition, steps will be taken to identify and plan for any continuing monitoring requirements needed to demonstrate control of any potential migration or to recognize future problems adequately

V.A.4.g. Fuel Oil Tank, 600 Area. One of the fuel oil tanks (facility 221) located south of Central Avenue and west of 7th Street overflowed in January 1971 while being filled. This overflow (approximately 700 gal) was contained within the diked area, cleaned up, and the oil recycled (PC 1985b). A similar spill of approximately 400 gal occurred in February 1979.

CERCLA Finding - Remedial action completed, verification will be made under CEARP Phase V, therefore, a CERCLA finding for FFSDIF, PA, and PSI is not appropriate, nor is HRS Migration Mode scoring.

Planned Future Action - Reconnaissance data will be collected as part of CEARP Phase V to verify and document the adequacy of the remedial action. In addition, steps will be taken to identify and plan for any continuing monitoring requirements needed to demonstrate control of any potential migration or to recognize future problems adequately.

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V.A.4 h. Lithium Metal Destruction Site. 300 Area Building 335 is constructed over an old lithium metal destruction site. Lithium metal was disposed of at this location by placing it in trenches and reacting it with water, the residues were covered with soil. In addition, the 335 Area (and later the building) was used by the fire department for training (Owen 1973).

CERCLA Finding - Positive for FFSDIF, PA, and PSI, HRS Migration Mode Score 8 (Appendix B).

Planned Future Action - This site will be evaluated under CEARP Phase II to determine whether future action is warranted under CEARP Phase III.

V.A.4.i. Reactive Metal Destruction Site, 900 Area. The 952 area, the reactive metals destruction site, is located south of the 903 drum storage area. This site was used during the 1950s and 1960s primarily for the disposal of lithium metal (400 to 500 lbs of lithium carbonate) buried in trenches. In addition, liquids (type unknown) were occasionally burned at this location (Owen 1973). The types and quantities of hazardous materials remaining at this site are unknown.

CERCLA Finding - Positive for FFSDIF, PA, and PSI, HRS Migration Mode Score 16 (Appendix B).

Planned Future Action - This site will be evaluated under CEARP Phase II to determine whether future action is warranted under CEARP Phase III.

VA.4.i. Chemical Storage. 500 Area. Prior to the mid-1970s, a non-radioactive chemical storage area existed east of Building 551. This area was used to store drum quantities of acids, oils, soaps, and solvents. Records indicate that leaks may have occurred in this area (Owen 1973). The quantity of solvent that remains in the soil at this site is unknown.

CERCLA Finding - Positive for FFSDIF, PA, and PSI, however, there is not sufficient information to calculate a HRS Migration Mode Score.

Planned Future Action - A CEARP Phase I reconnaissance field study will be conducted to determine the presence or absence of hazardous substances and the potential

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for migration into various environmental pathways. Based on the results of this study, appropriate action will be taken.

VA4k Fiberslassing Areas (2), 600 Area. During the 1970s, locations both north and west of Building 664 were used for fiberglassing waste packing boxes. Persons interviewed mentioned that these locations may contain spilled polyester resin, peroxide catalyst materials, and cleaning solvents. The chemical concentrations remaining in the soil at these sites are unknown

CERCLA Finding - Positive for FFSDIF, PA, and PSI; however, there is not sufficient information to calculate a HRS Migration Mode Score.

Planned Future Action - A CEARP Phase I reconnaissance field study will be conducted to determine the presence or absence of hazardous substances and the potential for migration into various environmental pathways. Based on the results of this study, appropriate action will be taken.

<u>V.A.41. Liquid Dumpine. 200 Area.</u> Persons interviewed mentioned that prior to 1969, the area east of Building 281 was used for dumping liquid and for disposing of empty drums (type of liquid or residual material in the drums was unknown). The ground surface was covered with scrap metal and disturbed, indicating burial of some type. The concentration of hazardous material that may be present in the soil at this site is unknown.

CERCLA Finding - Positive for FFSDIF, PA, and PSI; however, there is not sufficient information to calculate a HRS Migration Mode Score.

Planned Future Action - A CEARP Phase I reconnaissance field study will be conducted to determine the presence or absence of hazardous substances and the potential for migration into various environmental pathways. Based on the results of this study, appropriate action will be taken.

<u>V.A.4.m.</u> Chemical Burial. 800 Area. Some persons interviewed mentioned that the area south of Building \$81 was used to bury unknown chemicals. Concentrations of hazardous materials that remain in the soil at this site are unknown.

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CERCLA Finding - Positive for FFSDIF, PA, and PSI, however, there is not sufficient information to calculate a HRS Migration Mode Score

Planned Future Action - A CEARP Phase I reconnaissance field study will be conducted to determine the presence or absence of hazardous substances and the potential for migration into various environmental pathways. Based on the results of this study, appropriate action will be taken

V.A.4.n. Outfall. 800 Area. Persons interviewed mentioned that an outfall existed south of Building 881. This outfall probably was the pipe on the hillside south of Building 881 that discharged water in December 1977. Water samples determined that this pipe is a cleanout pipe for an overflow line from a cooling tower (PC 1985c).

CERCLA Finding - Positive for FFSDIF, PA, and PSI, however, there is not sufficient information to calculate a HRS Migration Mode Score.

Planned Future Action • A CEARP Phase I reconnaissance field study will be conducted to determine the presence or absence of hazardous substances and the potential for migration into various environmental pathways. Based on the results of this study, appropriate action will be taken.

V.A.4.o. Out-of-Service Fuel Tanks. 800 Area. Persons interviewed stated that asbestos was placed in two out-of-service #6 fuel oil tanks located south of Building 881 and that the tanks were then filled with concrete (PC 1985a)

CERCLA Finding - Positive for FFSDIF, PA, and PSI, however, there is not sufficient information to calculate a HRS Migration Mode Score.

Planned Future Action - The tanks will be included in the onsite tank inventory (Sec. V B 6.d). A CEARP Phase I reconnaissance field study will be conducted to determine the presence or absence of hazardous substances and the potential for migration into various environmental pathways. Based on the results of this study, appropriate action will be taken.

V.A.4.p. Acid Leaks (2), 400 Area. In September 1970, approximately 1,500 gal of sulfuric acid was spilled inside Building 443 and drained eastward from the

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building. This acid was captured in an earthen trap dug in an open field and neutralized with lime (Owen 1973, PC 1985c). The trap is now covered by buildings.

Persons interviewed mentioned that another acid leak occurred north of Building 444 Several hundred gallons of acid leaked from a tank and flowed along Central Avenue in the drainage ditch. Details on cleanup operations are not known

These scids would have been neutralized by the buffering action of the soil, and the resulting by-products would have been benign and highly mobile in the environment. No environmental hazard should remain.

CERCLA Finding - Negative for FFSDIF, PA, and PSI, therefore, a HRS Migration Mode Score is not calculated.

Planned Future Action - No further action is warranted.

Y.A.4.a. Acid Leak. 300 Area. Persons interviewed mentioned that a drum containing a mixture of nitric acid and hydrochloric acid leaked near the east gate of Building 374 in 1983. This acid would have been quickly neutralized by the buffering action of the soil, and the resulting by-products would have been benign and highly mobile in the environment. No environmental hazard should remain.

CERCLA Finding - Negative for FFSDIF, PA, and PSI, therefore, a HRS Migration Mode Score is not calculated.

Planned Future Action - No further action is warranted.

V.A.4.r. Multiple Acid Spills. 800 Area. Persons interviewed mentioned that there had been acid spills both north and west of Building 881. Spilled material was washed down with water to dilute the acid and disperse it on the ground.

The dilute acids would have been quickly neutralized by the buffering action of the soil, and the resulting by-products would have been benign and highly mobile in the environment. No environmental hazard should remain.

CERCLA Finding - Negative for FFSDIF, PA, and PSI; therefore, a HRS Migration Mode Score is not calculated.

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Planned Future Action . No further action is warranted

VA4s. Caustic/Acid Spills. 700 Area From the start of operation to the present, numerous small leaks and spills of caustic and acid have occurred in the area around Building 771 while tanks were being filled and and material was being transferred. Potassium hydroxide and sodium hydroxide supply tanks are located south of Building 771, and hydrofluoric acid (HF) is handled at the HF storage area (Owen 1973).

During the interviews, people mentioned that there had been small leaks and spills at the caustics receiving areas north and south of Building 774. These spills were washed down with water, diluting the spilled material and carrying the diluted chemical away from the building.

The caustics and/or acids would have been quickly neutralized by the buffering action of the soil, and the resulting by-products (sodium, potassium, sulfates, and aitrates) would have been benign and highly mobile in the environment. However, the fluoride concentrations remaining in the environment are unknown.

CERCLA Finding - Positive for FFSDIF, PA, and PSI, however, there is not sufficient information to calculate a HRS Migration Mode Score.

Planned Future Action - A CEARP Phase I reconnaissance field study will be conducted to determine the presence or absence of hazardous substances and the potential for migration into various environmental pathways. Based on the results of this study, appropriate action will be taken.

V.A.4.t. Caustic Leak. 400 Area. In 1978, approximately 1,000 gal of concentrated sodium hydroxide was accidentally released from the steam plant catch basin to the Central Avenue ditch. This liquid was diverted to retention pond B-1 on South Walnut Creek for temporary containment and neutralization. Several actions were taken that prevented the material from leaving the plant. After alum was added to neutralize the contents of retention pond B-1, the liquid in retention pond B-1 was transferred to the 207 solar evaporation pond B-North (PC 1985b). Any sodium hydroxide remaining in the environment would have been neutralized by the buffering action of the soil. No environmental hexard should remain.

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CERCLA Finding - Negative for FFSDIF, PA, and PSI, therefore, a HRS Migration Mode Score is not calculated

Planned Future Action - No further action is warranted

V.A.4.u. Hydrogen Peroxide Soill 400 Area. In April 1981, a 55-gal drum of hydrogen peroxide was dropped at the corner of 5th Street and Central Avenue. The drum ruptured, and the liquid was contained in a hole dug at this location. The hole was subsequently covered (PC 1985b). This spill would have been neutralized by the buffering action of the soil. No environmental hazard should remain.

CERCLA Finding - Negative for FFSDIF, PA, and PSI, therefore, a HRS Migration Mode Score is not calculated.

Planned Future Action - No further action is warranted.

V.A.4.v. Multiple Solvent Spills. 400 Area. Persons interviewed mentioned that prior to 1979 both the southwest and west side of Building 444 were used for monradioactive solvent storage. Because of minor leaks and spills, these locations may contain low levels of hydrocarbons. It is not known if solvents remain in the soil at this site.

CERCLA Finding - Positive for FFSDIF, PA, and PSI, however, there is not sufficient information to calculate a HRS Migration Mode Score

Planned Future Action - A CEARP Phase I reconnaissance field study will be conducted to determine the presence or absence of hazardous substances and the potential for migration into various environmental pathways. Based on the results of this study, appropriate action will be taken.

V.A.4.w. Multiple Solvent Spills, 700 Area. Carbon tetrachloride tranks are located within diked areas north and south of Building 776 and north of the Building 776 compressor house. These tanks everflowed during the 1970s, and small leaks and spills occurred during tank filling operations. In addition, one of these tanks ruptured in June 1981. The solvent drained into a sump, which pumped some of the liquid omto the ground surface (PC 1985b).

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Persons interviewed mentioned that 100 to 200 gal of trichloroethylene was spilled (prior to 1970) at the north side of Building 776. They did not recall any mitigation measures. This spill may have been carbon tetrachloride (PC 1985a). It is not known whether solvents remain in the environment at these sites.

CERCLA Finding - Positive for FFSDIF, PA, and PSI, however, there is not sufficient information to calculate a HRS Migration Mode Score

Planned Future Action - A CEARP Phase I reconnaissance field study will be conducted to determine the presence or absence of hazardous substances and the potential for migration into various environmental pathways. Based on the results of this study, appropriate action will be taken.

V.A.4.x. Multiple Solvent Spills. 900 Area. Locations along the perimeter road south of the old East Guard Gate (Gate 9) were used as solvent storage areas. Persons interviewed menmoned that there may have been minor leaks or spills. This road also had used motor oil put on it for dust control. It is not known if solvents or oil residuals remain in the soil at this site.

CERCLA Finding - Positive for FFSDIF, PA, and PSI; however, there is not sufficient information to calculate a HRS Migration Mode Score

Planned Future Action - A CEARP Phase I reconnaissance field study will be conducted to determine the presence or absence of hazardous substances and the potential for migration into various environmental pathways. Based on the results of this study, appropriate action will be taken

VA.4.v. Antifreeze Discharge. Original Plant Site Outside the Security-Fenced Area. In December 1980, approximately 155 gal of 25% ethylene glycol (antifreeze) was released from a chiller unit into a floor drain in Building 708. The flow was contained by diverting the storm water system discharge into retention pond B-1 (PC 1985c) The ethylene glycol introduced into the environment from this spill would no longer be detectable. No environmental hazard should remain.

CERCLA Finding - Negative for FFSDIF, PA, and PSI; therefore, a HRS Migration Mode Score is not calculated.

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Planned Future Action - The retention ponds will be examined under CEARP Phase II (Sec V A 31) No further action is warranted.

V.A.4.z. Steam Condensate Leak. 400 Area In November 1979, a steam condensate line between Building 443 and a valve pit north of the gasoline storage

tank leaked. Water analyses indicated a low concentration (0.135 ppm) of amines. This line was taken out of service and the condensate was rerouted through a different system (PC 1985b). The amines introduced into the environment from this leak would no longer be detectable. No environmental hazard should remain.

CERCLA Finding - Negative for FFSDIF, PA, and PSI; therefore, a HRS Migration Mode Score is not calculated.

Planned Future Action - No further action is warranted.

V.A.4.22. Steam Condensate Leak, 700 Area. In September 1979, a steam condensate line broke near Building 707 and water from this line flowed through pond B-4 into Walnut Creek. This leak did not present any environmental hazard.

CERCLA Finding - Negative for FFSDIF, PA, and PSI, therefore, a HRS Migration Mode Score is not calculated.

Planned Future Action . No further action is warranted.

V.A.4.bb. Nickel Carbonvi Disposal. Original Plant Site Outside the Security-Fenced Area. Persons interviewed mentioned that several bottles of nickel carbonyl were destroyed in a hole drilled onsite south of Lindsay Ranch. The valves were cracked open and the cylinders were lowered into the hole by ropes. After 24 hrs the cylinders were removed, vested by small arms fire, and buried in the present onsite landfill. Two cylinders got stuck in the hole and were buried in place. Nickel carbonyl is highly volatile, and venting these cylinders in this hole would not result in an environmental hazard. No environmental hazard should remain.

CERCLA Finding - Negative for FFSDIF, PA, and PSI; therefore, a HRS Migration Mode Score is not calculated.

Planned Future Action - No further action is warranted.

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V.A.4.cc. Water Treatment Plant Backwash Pond, 100 Area Persons interviewed mentioned that during the early 1970s, backwash from the raw water treatment plant (Building 124) was collected in a pond on the south side of the building. This water would have contained flocculates (aluminum sulfate and lime), residual chlorine. and suspended solids. They said the pond dried up and was destroyed in the late 1970s when the new canal system that reroutes surface water around the plant site was constructed. The materials introduced into the environment from this pond would not pose an environmental hazard.

CERCLA Finding - Negative for FFSDIF, PA, and PSI; therefore, a HRS Migration Mode Score is not calculated

Planned Future Action - No further action is warranted

V.A.4.dd. Scrap Metal Sites, 500 Area. People said during the interviews that two scrap metal disposal sites (nonradicactive, nonhazardous, nonprecious metals) southwest of Building 559 were removed in the early 1980s when the personnel security zone (PSZ) was constructed. They also said that one of these sites may have received some old transformers that contained PCBs. However, no transformers were found during the excavation (PC 1985c). No environmental hazard should remain,

The residue from these sites was monitored for radioactivity, found clean, and disposed of in the present onsite landfill.

CERCLA Finding - Negative for FFSDIF, PA, and PSI, therefore, a HRS Migration Mode Score is not calculated.

Planned Future Action . No further action is warranted.

V.A.4.eg. VOCs in Groundwater. Rocky Flats Plant conducted a preliminary screening of the plant's drinking water, surface water, and groundwater in March and April 1985, for volatile organic compounds (VOCs). Results of these analyses indicated that no VOCs were present in the drinking or surface water at the plant. However, these preliminary data do indicate the presence of VOCs in the groundwater: trichloroethylene 6,400 ppb; tetrachloroethylene 16,000 ppb; 1,1-dichloroethylene 1,300 ppb, and 1.1.1-trichloroethane 4,800 ppb (Setlock 1985b).

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NOTICE:

INCOMPLETE DOCUMENT

The following document is missing page V-48. This document was distributed in an incomplete state, and the microform copy is representative of the paper copy. If replacement pages are distributed, they will be microfilmed and included in the Administrative Record file.

Table V.S. Potential CERCLA Sites identified During CEAST Phose 1 ot Offoite Locations

Plemed (Mare Action	BOC CEART/CENCIA [©] Order Phase	Compliance and Varification (Place V)	Compliance and Verification (Place V)	Compliance and Varification (Phase V)	Compliance and Verification (Phase V)
	EPA CENCIA Prencia Eliment	i	i	•	•
	19	1	í	1	1
MP Photo 1	Kers .	1	1	1	1
POE CEARP Phese 1	frant/pa/psi	'n	1	1	1
	Status	Inactive	Inactive	Inactive	Inactive
	Sise	Land Surface Centemination	Great Western Reserveir	Standley Late	Mouse Meservoir

*federal facility Site Discovery and identification findings/Proliminary Assessments/Proliminary Site Impactions *Est Mazord Renting Dystom/DGE Maddied Mazord Banking Systom *Comprehensive Emvironmental Assessment and Beapense Program/Comprehensive Environmental Beapense, Compensation, a *Not Applicable

nt and Bosponus Prograe/Camprahemoive Environmental Bospones, Campanastian, and Liabillity Act

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The State of Colorado requires special construction techniques on land containing plutonium at concentrations greater than 2 dpm/g. This limit is far below the proposed EPA screening level derived from proposed dose limits. Based on this state-imposed limit, recent data indicate that some land directly east of the plant may require these special measures prior to construction activities. Samples taken using the state's criteria showed a median of 20 dpm/g for one parcel of land and 70 dpm/g for another; however, using another method of sampling (to a depth of 5 cm instead of 1 cm) these same samples yielded medians of 0.7 and 1.4 dpm/g respectively (RFEIS 1980)

CERCLA Finding - Measured radioactivity below EPA screening levels; verification will be made under CEARP Phase V; therefore, a CERCLA finding for FFSDIF, PA, and PSI is not appropriate, nor is HRS or MHRS scoring.

Planned Future Action - Based on current data, existing conditions do not pose an environmental risk (EPA 1976) Monitoring will be continued to detect any changes in existing conditions. Based on these data, appropriate actions will be taken.

V.A.5.b. Great Western Reservoir. Small amounts of plutonium-239 have accumulated in the sediments of the Great Western Reservoir, which lies approximately 15 mi east of the eastern edge of the plant boundary Part of the influent into this body of water is from the north and south forks of Walnut Creek, both of which flow east from the plant site. Great Western Reservoir (3,250 acre ft) is used as part of the municipal water supply for the city of Broomfield and has the capacity to support about 14,500 persons.

Numerous studies of plutonium and americium concentrations in the Great Western Reservoir have been made, including two by the EPA and others (EPA 1973, EPA 1975; Krey 1975, Thomas 1981, Setlock 1983). These studies have shown that detectable levels of plutonium exist at depth in the sedimentary column, but that the levels of radioactivity present (higher than fallout levels) do not constitute an environmental hazard. The plutonium in this sedimentary column is firmly attached to particulates, does not exhibit post-depositional migration, and is very insoluble in water.

The total plutonium and americium inventories (based on a single core sample) in the Great Western Reservoir are estimated at 244 mCi plutonium and 73 mCi americium,

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with most of this activity located in the deep sediment deposits at the eastern end of the reservoir (Thomas 1981).

Rockwell International has collected an extensive data base on the Great Western Reservoir to address plutonium concentrations in reservoir sediment as related to plant operations (Setlock 1985a) Analyses of more than 60 sampling locations within the reservoir have shown that sedimentation rates within the reservoir are not uniform, but rather. sediments accumulate at a higher rate in the eastern (deeper) portion of the reservoir in addition, these data validate the studies performed in the 1970s showing fallout levels of plutonium in sediments from above-ground weapon tests conducted elsewhere in the 1950s and 1960s. Sediment core profiles show plutonium concentrations peak at depth (former deposition), and indicate that no post-depositional migration is occurring in the sedimentary column (the plutonium is fixed to particulates at depth). Data from this study will be used to update inventories of radioisotopes in the Great Western Reservoir.

The naturally occurring radium-226 in surface and domestic waters near the plant represents a much greater relative contribution to public radiation exposure than do traces of plutonium. The measured activity of radium-226 has been 100 to 1,000 times greater than that of plutonium (Thomas 1981) Therefore, no additional studies will be performed on the Great Western Reservoir under CEARP

CERCLA Finding - Measured radioactivity below EPA screening levels; verification will be made under CEARP Phase V, therefore, a CERCLA finding for FFSDIF, PA. and PSI is not appropriate, nor is HRS or MHRS scoring

Planned Future Action - Based on current data, existing conditions do not pose an environmental risk (EPA 1976). Monitoring will be continued to detect any changes in existing conditions. Based on these data, appropriate actions will be taken.

V.A.S.c. Standley Lake. Standley Lake is a large body of water (43,000 acre ft) located southeast of the plant, approximately 2 mi from the closest plant boundary. Woman Creek is a tributary of Standley Lake. The majority of water flowing into Standley Lake is from Clear Creek via an irrigation ditch. This reservoir is used as a part of the municipal water supplies for the communities of Westminster, Northglenn, and Thornton.

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Numerous radiological studies have been made of Standley Lake (EPA 1973, EPA 1975, Thomas 1981, and Setlock 1985c). Plutonium and americium are found in the sediments of the lake at levels at or slightly above worldwide fallout. However, these levels are below levels that would pose a health hazard to area residents (Thomas 1981). The total inventories of plutonium and americium (based on a single core sample) in Standley Lake are estimated at 61 mCi plutonium and 18 mCi americium.

As previously mentioned, the naturally occurring radium-226 in surface and domestic waters near the plant represents a much greater relative contribution to public radiation exposure than the traces of plutonium. The measured activity of radium-226 has been 100 to 1,000 times greater than that of plutonium (Thomas 1981)

CERCLA Finding - Measured radioactivity below EPA screening levels; verification will be made under CEARP Phase V, therefore, a CERCLA finding for FFSDIF, PA, and PSI is not appropriate, nor is HRS or MHRS scoring.

Planned Future Action - Based on current data, existing conditions do not pose an environmental risk (EPA 1976). Monitoring will be continued to detect any changes in existing conditions. Based on these data, appropriate actions will be taken.

V.A.S.d. Mower Reservoir. Mower Reservoir is a small body of water located southeast of the plant that receives water from Woman Creek via an irrigation ditch originating on the plant site. Little documentation exists on this small reservoir Concentrations of radioisotopes on sediments in this reservoir would not be expected to exceed those found in either Great Western Reservoir or in Standley Lake. These two bodies of water have been carefully analyzed as mentioned above (Sec. VA5b and VA.Sc).

CERCLA Finding - Measured radioactivity below EPA screening levels; verification will be made under CEARP Phase V; therefore, a CERCLA finding for FFSDIF, PA, and PSI is not appropriate, nor is HRS or MHRS scoring.

Planned Future Action - Based on current data, existing conditions do not pose an environmental risk (EPA 1976). Monitoring will be continued to detect any changes in existing conditions. Based on these data, appropriate actions will be taken.

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V.B. Overview of Activity

Rocky Flats Plant was established in 1952 on land that was previously used for cattle grazing. Operations conducted at the plant were and still are devoted to making metal components for nuclear weapons and recovering these metals from components returned to the plant. A more detailed description of the plant and its operations is found in its environmental impact statement (RFEIS 1980)

Waste management programs have existed since operations started in 1952 Nonradioactive wastes generated at the plant have been segregated for onsite disposal or resale to commercial recycle vendors (WMSP 1983). Most solid radioactive wastes and solidified liquid radioactive wastes have been shipped offsite for disposal at other DOE facilities. Prior to 1970, some liquid radioactive waste (primarily lathe coolant, a mixture of about 70% hydraulic oil and 30% carbon tetrachloride) was stored in drums, awaiting development of an approved solidification process. These wastes have since been solidified and shipped offsite (WMSP 1983). Some radioactive waste was buried in onsite trenches (Sec. V A.3.d through V A.3 g) and some radioactively contaminated soil was also buried onsite (Sec. V A.2.f).

The plant has always had an active salvage operation. Materials of value were and still are salvaged for resale following verification of no radioactive contamination (RFEIS 1980). The remaining nonradioactive trash has always been disposed of onsite.

All known landfills, surface deposits, impoundments, and other waste contamination sites, including leaks and spills, within the land area controlled by the plant can be attributed to plant activities.

The plant encompasses eight areas within the security fence, the original plant site outside the security-fenced area, and the buffer zone, as shown in Figs. II.2 and II.3.

V.B.I. Waste Generation. The types of wastes generated at the plant have been consistent throughout its history. However, major changes in waste management have been made. For example, from 1954 to 1958, drums containing radioactively contaminated liquid wastes (primarily lathe coolant) were buried in the mound area (located morth across Central Avenue from the 903 drum storage area), and from 1959 to the late 1960s, similar drums were stacked in the 903 drum storage area (Fig. II.3). Removal of the drums from these areas began in 1967 and was completed in 1970 (see Sec V A 3 k and

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VA31 for a more detailed discussion of these activities and planned future actions regarding these sites). From 1956 to 1965, depleted uranium-contaminated oils were burned in open pits, and from 1954 to 1968, depleted uranium, flattened depleted uranium-contaminated drums, and sanitary sewage sludge were buried onsite in trenches (located near the plant's old east access gate, Gate 9; Fig. II 3). These sites were closed and covered in place. These practices were discontinued in the 1970s, and currently, all radioactive wastes are processed and shipped offsite for disposal at other DOE facilities (WMSP 1983, HWIP 1983, Putzier 1970). Planned future actions regarding these sites are given in Sec VA.

Wastes generated at the plant can be classed as radioactive, radioactive/hazardous chemical (inherently or intentionally mixed), nonradioactive hazardous chemical (RCRA-, TSCA-, or NESHAPS- regulated), or nonradioactive nonhazardous. A radioactive/hazardous chemical waste is a waste containing both radioauclides and a nonradioactive hazardous chemical.

Specific guidelines for safely handling hazardous materials (chemical, radioactive, or both) appear in the Rocky Flat Plant's Material Hazards Masual.

<u>V.B.2.</u> Waste Management. Rocky Flats Plant has a comprehensive waste management program for collecting, processing, recycling, and disposing of all wastes resulting from plant operations. An overview of this waste management program is presented below.

V.B.2.s. Permits.

DOE/Rockwell International currently hold the following permits:

- (1) Building 122. Incinerator Permit C-12,931 was issued by the Colorado Department of Health on Mar. 25, 1982. This permit restricts the incinerator use to burning waste paper, and limits particulate emissions to .45 lbs/h and to .22 tons/yr, based on a total process weight of 125,000 lbs/yr and an operating schedule of 5 h/d for 250 ds/yr Visible emissions are limited to 20% opacity.
- (2) Building 771. Incinerator Permit C-12,932 was issued by the Colorado Department of Health on Nov. 3, 1981, and was revised in April 1985. It restricts incinerator use to burning plutonium-contaminated plastic, paper, rubber, cloth, wood, etc. at an

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average feed-rate of 40 lbs/h. The permit requires the incinerator to use a potassium hydroxide scrubbing chamber and high efficiency, particulate air (HEPA) filters for emission control. The permit revisions allow the incinerator to be operated 24 h/d until the backlog is processed and 16 h/d thereafter.

- (3) Building 776. Fluid Bed Incinerator Permit C-13,022 was issued by the Colorado Department of Health on Mar 25, 1984. It covers two incinerator units, but does not allow simultaneous operation of the units. The permit limits use to burning plutonium-contaminated solid and liquid wastes. Particulate emissions are limited to 28 tons/yr and to .35 lbs/h when burning solid waste, and to 04 tons/yr and 25 lbs/h when burning liquid waste. The exhaust from these incinerators passes through a bank of HEPA filters.
- (4) National Pollutant Discharge Elimination System (NPDES) Permit CO-0001333, issued by the EPA on Dec. 26. 1984, governs the discharges from seven release points (six fixed and one mobile). The lixed release points are outfall 001, which discharges from retention pond B-3; outfall 002, which discharges from retention pond A-3, proposed outfall 004, which will discharge from the reverse osmosis plant; outfall 005, which discharges from retention pond B-5; and outfall 007, which discharges from retention pond C-2. The mobile release point is outfall 003, which discharges from the reverse osmosis pilot plant, at retention ponds A-3, A-4, B-4, B-5, C-1, and C-2.
- (5) The plant has an interim status permit, ID No CO 07890010526, issued by the EPA under the Resource Conservation and Recovery Act (RCRA). The state of Colorado has issued a notice of its tentative decision to terminate the interim status (Sec. IV B 2).
- (6) The satellite facility, Precision Forge, was issued Ventura County Air Pollution Control District Permit No. 1203 on Oct. 25, 1982. This permit governs 23 furnaces for standard nonradioactive emissions.
- (7) The satellite facility at Broomfield may need a local permit from the city of Broomfield. Rockwell International has applied for a City of Broomfield Waste Water Discharge Permit.

The Lake Arbor satellite facility has not needed any permits to date. A listing of all environmental permits, orders, or notices issued by federal, state, or local regulatory

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agencies will be included in future environmental monitoring reports in accord with the 1985 draft DOE Order 5484 1 as environmental program information

V.B.2.b. Waste Processing and Disposal. Current waste management practices for separation and disposal of liquid and solid wastes generated at the plant are well documented (WMSP 1983, HWIP 1983) Radioactive and radioactive/hazardous chemical wastes are disposed of offsite at other DOE facilities. Nonradioactive hazardous wastes are commercially recycled, commercially disposed of, chemically rendered nonhazardous, or handled in radioactive waste process systems. Nonradioactive, nonhazardous wastes are disposed of onsite in the sanitary landfill.

V.B.2.b.1. Radioactive and Radioactive/Hazardous Chemical Wastes.

Radioactive wastes at DOE facilities are subdivided into low-level waste (LLW) and transurance (TRU) waste, based on the quantity of plutonium. TRU waste has greater than 100 nanocuries of plutonium per gram of waste and a half-life greater than 20 years. This distinction is made because the two types of wastes are managed differently. Both of these wastes are shipped offsite from Rocky Flats Plant to other DOE facilities; however, at the receiving facilities, TRU waste is placed into retrievable storage sites and LLW is placed into disposal sites (HWIP 1983, WMSP 1983, RFEIS 1980).

Figure V.1 gives a conceptual flow-path for radioactive waste management at Rocky Flats Plant. All radioactive solid wastes and solidified radioactive liquids (such as solidified lathe coolant) are separated into TRU and LLW fractions and shipped offsite Radioactive aqueous liquid wastes are first neutralized and then precipitated Precipitation sludges are processed to produce solid waste; the liquid effluent is retreated, evaporated, or recycled by additional purification to reuse onsite. Solids from the evaporation process (most of them nitrate salts) are solidified by cementation, packaged, and shipped offsite. The distinction between the TRU and LLW fractions will not be made elsewhere in this report, rather, both will be referred to as radioactive waste.

After the silver has been recovered, spent photographic and radiographic fixing solutions are combined with the radioactive waste stream and treated as radioactive liquid waste. Radioactive liquids that are incompatible with the above process are treated separately. Lathe coolant and organic solvents are solidified with Environstone (trademark), a

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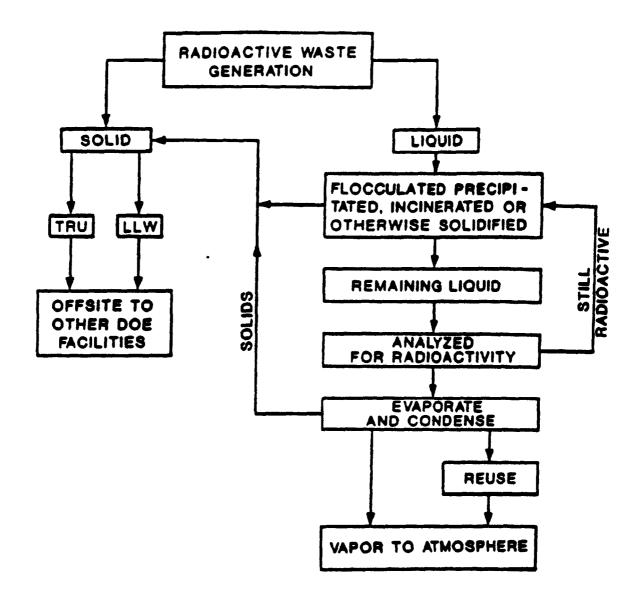


Figure V.I. Conceptual Flow Path for Radioactive Wastes

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polymer-modified gypsum cement. These solidified liquids are then shipped offsite as radioactive waste (WMSP 1983).

Currently, most of the industrial liquid wastes generated in buildings containing radioactive materials are mixed into the radioactive waste stream. A dual system may need to be installed to allow for separate management of nonradioactive hazardous chemical wastes from these buildings. Rockwell International will perform a feasibility study on the installation of such a system.

Radioactively and PCB-contaminated solids are currently being held onsite awaiting development of an EPA-approved disposal technology (Sec. V B.3 a). DOE is seeking an appropriate disposal method for this waste. If appropriate disposal methods have not been identified, feasible alternatives for treatment or disposal of this waste will be proposed under CEARP Phase HI

Y.B.2.b.2 Radioactive Waste Management Facilities. Five buildings or parts of buildings are dedicated to handling radioactive waste. The plant also has a radioactive liquid process waste collection system, consisting of pipelines and holding tanks. These systems are double-contained and routinely inspected.

(1) Building 774 is devoted to treating radioactive liquid process wastes. Liquid process wastes from plutonium recovery operations conducted in Building 771, and liquid process wastes from machining and other operations are processed in Building 774. The liquids are processed to yield salts, sludge, solids, and water containing residual radioactive contamination. The dried salts and sludge are packaged in drums to be shipped offsite to other DOE facilities as radioactive waste. Liquid hydrocarbon wastes are processed into solids and packaged in drums, also to be shipped offsite. The contaminated water is sent to Building 374 for final processing.

Carbon tetrachloride is removed from the waste stream in Building 774 by air sparging. This practice requires evaluation to determine if the quantities of carbon tetrachloride released meet the State of Colorado Air Quality regulations (Sec. IV.D.3).

(2) The new waste treatment fecility, Building 374, has replaced Building 774 as the primary radioactive liquid process waste treatment facility. Radioactive chemical process wastes and liquids, such as laundry water and process cooling water, are treated here. The liquids are treated by precipitation and evaporation processes that result in a

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final product of sludge or salts and distilled water. The sludge and salts are monitored. packaged in approved sealed containers, and shipped offsite to DOE facilities as radioactive waste. The distilled water is reused onsite as boiler feed and cooling tower water

- (3) Building 776 contains a size-reduction area where plutonium-contaminated, obsolete equipment and used HEPA filters are washed and abraded to remove as much plutonium as possible prior to disposal. The cleaned materials are then crushed, cut, or otherwise processed to reduce their volume and are packaged in metal drums or metal boxes as radioactive waste for shipment offsite to other DOE facilities. The liquid process waste from the washing operation is filtered and placed in holding tanks. After monitoring, it is piped to Building 374 for treatment. The used filters and sludge from the washing operation are packaged and sent to Building 771 for plutonium recovery.
- (4) Building \$89 has an area where equipment with uranium contamination is decontaminated prior to being reused, resold, or reduced in size and packaged as radioactive waste for shipment offsite to other DOE facilities. Liquid waste from the decontamina. tion operation is retained in a holding tank. This liquid waste is sampled prior to being transferred to Building 374 for treatment.
- (5) Building 664 is used to prepare and load shipments of inspected and accepted drums and boxes of processed solid radioactive wastes for shipment offsite to other DOE facilities.

V.B.2.b.2.a. Liquid Radioactive Waste. Liquids contaminated with radionuclides are carefully controlled, collected, and processed to remove radioactive contaminants. The contaminants are then concentrated, solidified if necessary, and packaged for shipment to another DOE facility as radioactive waste.

Each building that has production, research, or support facilities is which radioacgive materials are handled is equipped with a radioactive process waste collection system. This system, which is isolated from the sanitary waste collection system, collects radioactive liquid wastes from such sources as process drains, decontamination showers, laboratory sinks, janitors' sinks, and floor drains located in areas that might be radioactively contaminated. The radioactive process waste collection system also disposes of water used in fire fighting in these areas. The collected radioactive liquid wastes are held in appropriate tanks pending analysis of the contaminants and determination of treatment

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Depending on the origin, the waste may be analyzed for plutonium, americium, uranium, hexavalent chromium, beryllium, nitrates, pH, or other contaminants as appropriate

The majority of the plant's radioactive process waste holding tanks are connected by pipeline to the radioactive waste treatment facilities. Several buildings that produce small volumes of radioactive wastes are serviced by portable tanks or smaller, closed containers. These radioactive wastes are transported by truck to the radioactive waste treatment facilities.

Organic liquid wastes, machine oils, lubricants, and solvents are collected in separate holding tanks and transferred to the radioactive waste treatment facilities by separate pipelines or containers. Highly toxic radioactive process waste is shipped intraplant in double containment to contain leaks. Low toxicity materials may be moved in stainless steel dumpster equipment.

The majority of radioactive pollutants are removed from the plant's process waste streams by normal chemical processing operations within the plutonium recovery facility. The resultant effluents from plutonium recovery operations, together with liquid process wastes from other production buildings, are transferred to one of the radioactive waste treatment facilities. These effluents undergo a chemical precipitation process that produces sludge and radioactively decontaminated liquid, both of which require additional processing. The liquid, which contains soluble salts essentially free of radioactivity, is concentrated in a multiple-effect evaporator.

The first stage in the operation treats only the liquid from the plutonium recovery process, such as ion column effluent, distillate, americium ion column effluent, caustic scrub solution, hydrochloric acid effluent, condensates, and miscellaneous solutions

Acid wastes are first made basic and the resulting solids are separated from the Liquid. The waste liquids are then combined and passed through a precipitation process. Ferric sulfate, calcium chloride, and a coagulating agent are used to form a precipitate with the radioactive contaminants.

The evaporator distillate is recycled to steam plant boilers, cooling towers, or evaporation ponds. The evaporator concentrate is fed to a spray dryer, which converts it to a dry, solid, salt waste. The precipitated sludge is filtered and dried, and the liquid filtrate is recycled to the chemical precipitation operation described above. The solid wastes (dry

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salts and sludge) are packaged in drums to be shipped to an offsite DOE facility as radioactive waste

Aqueous wastes not compatible with the above processes are isolated and solidified with cement and an absorbent material in specially prepared drums. The drums are referred to as 'cemented waste.'

The second-stage operation handles water from the first stage and all other process water at the plant that requires treatment. The second stage consists of two precipitation processes, one continuous, the other batch. The continuous process is used for liquids that are only radioactively contaminated. The batch precipitation process is used for all liquids that are chemically as well as radioactively contaminated. Both processes use the same chemical reagents as the first stage. The precipitate formed is filtered and packaged in drums as a radioactive sludge.

The treated effluent from both processes is held in isolated tanks until sample data can be obtained. When the plutonium content has been reduced to an acceptable level, the Liquid is processed in an evaporator

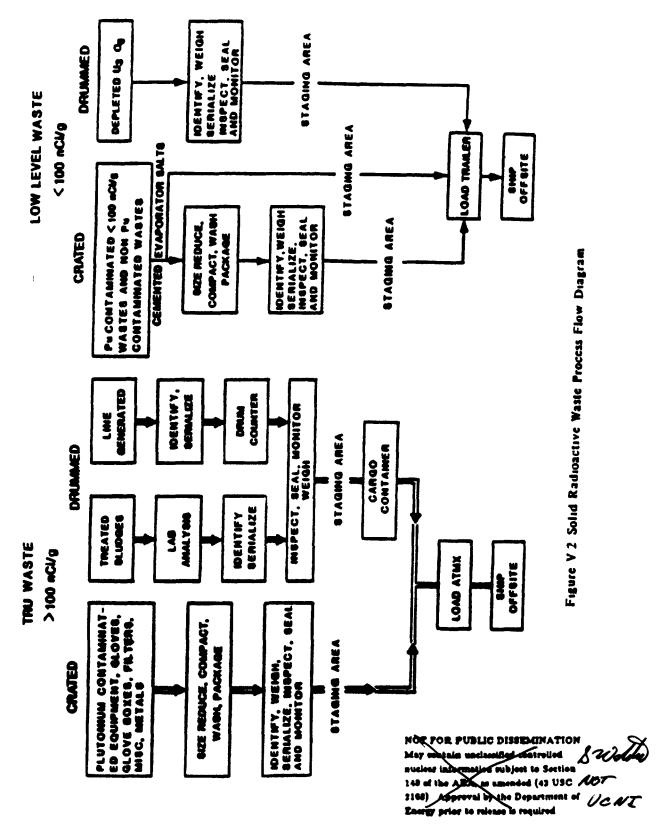
V.B.2.b.2.b Solid Radioactive Waste. Solid wastes that are radioactively contaminated or are from areas utilizing radioactive materials are (1) packaged for incineration. (2) decontaminated, or (3) crated or drummed to be shipped by truck or train to an offsite DOE facility as radioactive waste. Figure V 2 is a flow diagram of the solid radioactive waste disposal process. Where possible, the volume of waste is reduced by compaction, cutting, or disassembly.

Removing solid waste from glove boxes involves transferring the waste through a glove box opening into a plastic bag or sleeve clamped to the opening. The bag is then twisted, taped closed, and cut away. If the bag is left out even for a short period, it is placed in a second bag for added protection. These procedures are supplemented by forced, down-draft ventilation; individually fitted respiratory protection for all personnel; close radiation monitoring surveillance; and protection from external radiation sources Because of its origin, all waste of this type is considered by the Department of Transportation (DOT) to be of 'Not Otherwise Specified' (NOS) activity (formerly HSA or High Specific Activity). 'Low Specific Activity' (LSA) waste has less than 0.1 microcurie of plutonium per gram of waste; NOS waste contains more than 0.1 microcurie per gram

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By plant policy, originators are responsible for minimizing the amount and volume of solid waste generated and for assuring that radioactively contaminated waste shipped to a waste processing area is in a form suitable for processing. Solids containing recoverable radioactive material are segregated. Solid wastes destined to be shipped offsite must meet all applicable requirements and be inspected by quality acceptance personnel

If solid residues (such as sludge, treated residues, incinerator ash, sweepings, fines, and contaminated tools) from plutonium fabrication, assembly, or recovery processes contain recoverable amounts of plutonium, they are further processed through plutonium recovery operations. Remaining wastes are packaged as radioactive waste in drums for shipment offsite to other DOE facilities.

Sludge that is continuously removed from the waste treatment rotary-drum filters is packaged in 55-gal, plastic-lined drums. Solid residues (salts) from the waste treatment spray dryer are cemented and packaged in tri-wall corrugated fiberboard boxes prior to shipment offsite to other DOE facilities. Solid wastes are packaged for shipment in accordance with established, written procedures.

Solid wastes are segregated into several categories for packaging according to (a) density and chemical composition, (b) the amount and kind of radioactive material involved, if any, and (c) physical characteristics, such as bulk, weight, shape, and sharp edges or points that could affect packaging. The general packaging procedures begin with radiation monitoring personnel determining if wastes are, in fact, contaminated. If they are, the personnel determine the level and kind of radioactive contamination and record that information for waste management.

All waste packaging materials are subject to inspection and acceptance by quality assurance personnel. In addition, the originator of the waste inspects each drum to ensure that it is free from punctures, rust, and corrosion. Each drum lid must have a gasket and the sealing surfaces of the drum and lid must be free of any nicks, dents, or steps at the seams that could result in leaks. Shipping boxes are similarly inspected to assure they are sound and undamaged.

Depending on the type of waste and level of radioactive material present, various arrangements of liners are used inside the drums and boxes to provide double contain-

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ment. These liners are generally polyethylene or polyvinylchloride plastic. Each drum and box is marked with a unique number and the identity of its contents.

A radioactivity assaying instrument (drum counter) provides information to assure that drums containing residues for processing at the plant are not intermingled with drums containing processed waste to be shipped offsite.

After wastes are packaged and before they are shipped, radiation monitoring personnel monitor the outside of the containers to assure they are free of surface radioactive contaminants and that the amount of penetrating radiation is within established guidelines.

Waste management personnel thoroughly inspect the packaging for compliance with all applicable federal (DOE and DOT) requirements.

V.B.2.b.2.c. Radioactive Gases. The emissions given off by various plutonium recovery and other processing operations (such as incineration and residue dissolution) may contain small amounts of particulates of plutonium or other radioactive materials. The concentration of particulate radioactive material contained in such process emissions is reduced to levels 'as low as practicable' by prefilters, chemical scrubbers, and multiple-stage HEPA filters before emission to the atmosphere.

All process and ventilation air streams from buildings processing or storing radioactive materials pass through HEPA filters before being discharged to the environment. The building ventilation exhaust systems have two types of radioactive particulate monitoring systems. One type is a selective alpha air monitoring system (SAAM) that actuates alarm signals at preset levels, enabling personnel to initiate corrective actions to mitigate a release of particulate radioactive material to the environment. The second type of system uses multiple fixed-head particulate samplers and an air velocity probe and recorder to collect and record volumetric flow-rate data. Using the flow-rate data and laboratory analyses of the samples, the total particulate radioactive material discharges to the atmosphere can be calculated. In some buildings, a third system monitors the exhaust effluent for tritium gas.

<u>VB.2.c.</u> Nonradioactive Hazardous Chemical Waste. Nonradioactive hazardous chemical wastes are not disposed of at the plant, except for asbestos (discussed later in this section). These wastes are commercially disposed of, commercially recycled,

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or mixed with the radioactive waste stream and treated in the radioactive waste treatment facilities and shipped offsite to other DOE facilities as radioactive waste. Nonradioactive hazardous wastes or substances treated as radioactive waste are those generated in buildings containing radioactive materials listed in Table VI. Figure V3 shows disposal pathways for nonradioactive hazardous chemical waste or substances. Table V6 shows typical classes and annual quantities of nonradioactive hazardous chemical wastes or substances (excluding those treated as radioactive waste) managed at the plant (HWIP 1983)

As shown in Table V 6, the nonradioactive hazardous chemical waste generated at the plant is approximately 88% used oil, 5% radiographic solutions, 3% beryllium, 2% paint and paint solvent, 1% carbon tetrachloride, and 1% miscellaneous materials.

Used oil, scrap beryllium, and chlorinated hydrocarbon solvent wastes are recycled by commercial contractors. Those that are not recycled (those generated in buildings contraining radioactive materials) are processed with the radioactive waste and shipped offsite. Paint and paint solvent wastes are also recycled by commercial contractors; those that cannot be recycled are processed as radioactive waste. Radiographic solutions are processed to recover silver, and the stripped solution is processed as radioactive waste. Liquid PCBs and solid wastes contaminated with PCBs are manifested and sent to EPA-permitted disposal facilities. All nonradioactive RCRA and TSCA hazardous chemical wastes or substances held onsite awaiting offsite commercial disposal are kept in storage facilities designed to meet RCRA and TSCA requirements

There are a couple of small photographic shops at the plant that do not process enough film to require special handling of the spent photographic solution. These spent solutions are disposed into the sanitary sewer system.

Asbestos was used in the older buildings for insulation and heating systems. Asbestos waste is being disposed of onsite at the present landfill in an area designated for asbestos disposal, in accordance with EPA specifications under NESHAPS (40 CFR Part 61).

V.B.2.c.1. Nonradioactive Hazardous Chemical Waste Storage Facilities. Four steel cargo containers, 20 x 8 x 8 ft, fitted with air vents, electrical ground, and 7-in-deep catch basins are used to store nonradioactive hazardous chemical waste. These storage facilities were designed to meet RCRA requirements. Chlorinated

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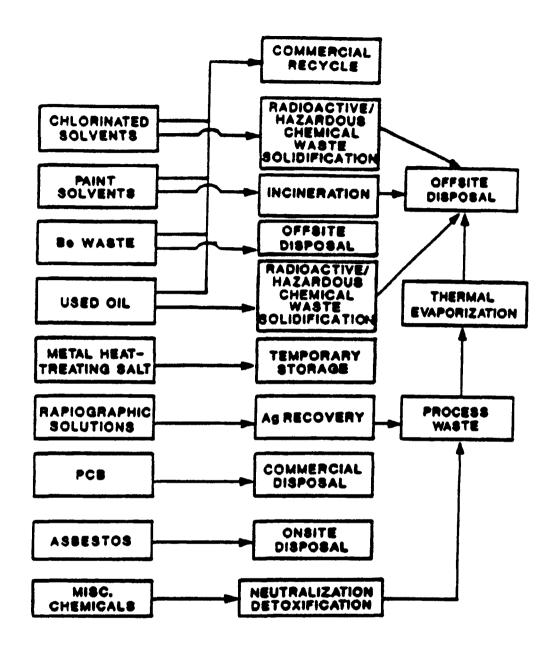


Figure V.3. Flow Chart for Hazardous Waste

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Table V 6 Typical Hazardous Materials Managed Annually

RCRA Hazardous Waste

Waste Material		V Initial inventor	y Generated	Shipped	Final Inventory
Carbon tetrachloride	F001**	450 gal	••	450 gai	••
Dichloroethane	F001	••	60 gai	430 841	
Trichloroethane	F001	20 gal	••	20 gai	60 gal
Used paint solvent	D001	**	420 gai	165 gal	260 gai
Surplus paint	D001	***	300 gal	.05 841	300 gai
Polyester resin	D001	•••	50 gal	•	200 BE!
Radiographic solutions		100 gal	2,400 gai		1,000 gal

NESHAPS Regulated Material

Waste Material	•	Initial Inventory Generated	Final Shipped Inventory
Beryllium scrap		10,400 lbs	10,400 lbs
Used oil		42,000 gal	42,000 gai

TSCA Regulated Material

Waste Material	Initial Inventory Generated	Shipped	Final Inventory
PCB			
Solid Waste	2 drums	2 drums	••
Liquid Waste	3 gai i gai	4 gal	••
Capacitors	- 13	13	••
Transformers	- 1	**	1

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Quantities listed in this table are approximations based upon data from calendar year 1983.

The EPA hazardous waste numbers correspond to those listed in the current RCRA Part A application, May 31, 1985.

[·] Reused onsite.

Processed 1,500 gal onsite to recover silver.

solvents, paints, and ignitable solvents have been stored in the remote storage area Storage times have varied from 3 months to more than a year PCB waste and metal heat-treating sait (oxidizer) have been stored in the cargo containers located within the security zone. Storage times for PCB waste have exceeded 3 years in the past. Future storage times for these wastes are not expected to exceed 1 year. The hazardous waste storage locations are shown in Fig. V 4

V.B.2.c.2. Nonradioactive Hazardous Chemical Waste Treatment Facilities. Two chemical laboratories onsite can detoxify small amounts of nonradioactive hazardous chemical waste (on a small beach scale-size operation) when needed. This facility was addressed in the RCRA Part B application. Reaction products from the laboratory treatment are disposed of as radioactive waste because radioactive materials are handled in the laboratories. Nonradioactive hazardous chemical wastes that have been disposed of in this manner include pyrophoric metals, small cylinders of toxic gases, and reactive chemicals. Records for this treatment appear among the radioactive waste records because the ultimate disposal is with the radioactive waste.

V.B.2.d. Nonradioactive Nonhazardous Waste. Solid wastes from all areas of the plant where little or no possibility of radioactive or chemical contamination exists are placed into transportable metal containers (Dempster Dumpsters) and are emptied into the present onsite sanitary landfill. Nonradioactive solid wastes from areas with possible radioactive contamination are monitored before being placed into locked containers. This prevents radioactive material from entering the nonradioactive waste stream. Materials taken to the present onsite landfill in the locked containers are spread and remonitored daily before burial to ensure no radioactive materials are present. These materials include scrap wood, nonrecoverable scrap metal, paper, carbon, graphite, garage rubbish, medical wastes (no biological hazard), empty gas cylinders (that cannot be reused), empty chemical containers, cafeteria garbage, and clarifier grease removed from sewage during treatment.

Two landfills are located at Rocky Flats Plant: the original, south, onsite landfill (closed) and the present, north, onsite landfill (active). These landfills have received most of the nonhazardous, nonradioactive solid wastes generated at the plant.

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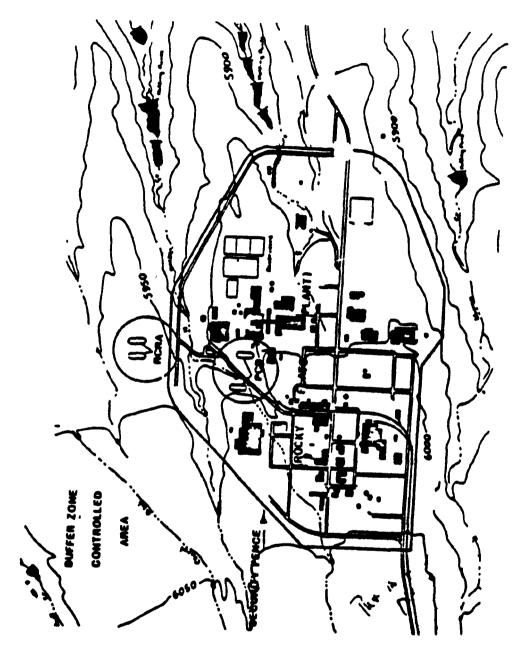


Figure V 4 Waste Storage Areas

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Current management practices for disposal of solid sanitary (nonhazardous and nonradioactive) wastes are well documented (WMSP 1983). These wastes are all disposed of onsite, and do not present a hazard to the environs of the plant.

V.B.2c. Sanitary System. Very little liquid effluent is released offsite from current sanitary system operations at the plant. Sanitary effluents are processed
through a tertiary sanitary treatment system. Effluent from this system meets all requirements for offsite release under limitations set forth in the existing NPDES permit
However, some of the water is retained onsite and further treated in the reverse osmosis
(RO) plant or stored in retention pond B-3. Treated water from the RO plant is stored to
use as cooling tower makeup water. The brine from the RO plant is mixed with the process waste stream and evaporated in the radioactive waste treatment facility. Water
stored in retention pond B-3 is sprayed onto and areas of the plant site.

Prior to 1979, tertiary treated sanitary waste water (the tertiary system was installed in the mid-1970s) was discharged routinely to South Walnut Creek in accord with conditions of the NPDES permit in effect at that time. Retention ponds B-1 and B-3 were used for temporary impoundment until the water could be analyzed prior to discharge downstream. This practice was discontinued when the RO plant was built, and retention pond B-1 is no longer used.

From 1969 to about 1973, laundry effluent that contained less than 1,600 dpm/l alpha activity and was low in nitrates was routed through the sanitary treatment system. This effluent is currently transferred to the radioactive liquid waste stream for treatment. The sanitary waste treatment process removed residual radioactive material from the liquid fraction and concentrated it in the sludge. Radioactive materials have not been introduced into the sanitary system for more than 10 years; however, very low residual radioactivity is still present. Prior to 1969, sanitary sewage sludge was either buried in trenches or disposed of in the present onsite laudfill. Since that time it has been packaged and shipped offsite to a DOE disposal facility as radioactive waste. Prior to 1983, small amounts of the dried sludge became airborne and were dispersed around the drying beds during packaging operations (see Sec. V.A.3 aa for a discussion of sanitary sewage sludge dispersal). These operations are now conducted in an enclosure.

The sewage treatment facility, Building 995, has had surge overflows (a peak load flow larger than the capacity of the plant) caused by groundwater infiltration into the

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Section V. Page V-70 DO44693 system. These events have not resulted in the sewage plant being bypassed, but have increased effluent flows through the outlet into South Walnut Creek to and through the Beseries retention ponds and into the stream channel. To prevent excessive groundwater infiltration, upgrading the existing sanitary collection pipe system was started in 1985. Because groundwater was able to infiltrate this system, the potential exists for contaminants from the system to migrate into the groundwater's pathway.

Sanitary system operations are documented by daily reports, and no major changes in this operation are indicated. Documentation of any potential problems from past sewage sludge dispersal and specific recommendations for further action, if indicated, will be provided under CEARP Phase II (Sec. V.A.3.aa). In addition, the sediments of the retention ponds will also be evaluated to determine if hazardous pollutants are present (see Sec. V.A.3.a).

<u>V.B.3. General Information</u>. Several items are of general interest or are not located within one specific area of the plant. These items are discussed here.

V.B.3.a. PCBs. Approximately 10,000 gal of PCB is in use in electric utility system components (including transformers and capacitors) and hydraulic systems at the plant. These items have been marked as containing PCB in accord with TSCA regulations. In addition, there are two small storage areas for holding nonradioactive PCB (both liquids from changing oil in equipment and PCB-contaminated solids such as transformers and capacitors) until these materials can be shipped to EPA-approved PCB disposal facilities.

Since the plant began operations, all large transformers have been diked, and no major leaks have occurred. No records prior to the late 1960s exist on replacement of small transformers or capacitors, on types of oil they may have contained, nor on their disposal. One person interviewed indicated that some of these items may have been placed into the acrap metal site west of Building 559. This site was removed while the personnel security zone (PSZ) was being constructed in the early 1980s, and no transformers or capacitors were found. All the material removed was disposed of at the present on-site landfill (Sec. V.A.3 c).

Currently, no radioactive, PCB-contaminated liquid exists at the plant. The last of this material was shipped another DOE facility for disposal by incineration during the

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summer of 1984. Currently, about 14 drums of solid radioactive, PCB-contaminated material (kim wipes, coveralls, transformers, capacitors, etc.) are being stored awaiting an EPA-approved disposal technology

No releases of PCB into the environs at the plant are known to have occurred. The only indicated action regarding PCB at the plant is to obtain EPA approval for disposal of radioactive, PCB contaminated solids. DOE is seeking this approval. If an acceptable disposal approach is not identified, alternatives for disposal will be sought under CEARP Phase III.

V.B.3.b. Sanitary Sewage Sludge. Sanitary sewage sludge has been disposed of in three separate ways since plant operations started: I) burying it in trenches (1954 to 1968); 2) burying it in the present onsite landfill (1968 to 1969); and 3) having it drummed and shipped offsite to another DOE facility as radioactive waste (1969 to present). The plant will continue to ship all sanitary sewage sludge offsite for disposal as radioactive waste. CEARP Phase II will undertake to characterize any sludge that may remain around the drying beds (Sec. V.A.3.22).

VB.3.c. Biocide Use. Biocides are used on the plant site (following requirements promulgated under Article 10, Title 35 of the Colorado Statutes of 1973 as amended) to control pests and weeds. All pest and weed control is performed in accordance with procedures outlined in the Health, Safety, and Environment Manual and are coordinated with the Jefferson County Extension Service and the State of Colorado Department of Agriculture. The Industrial Hygiene Group documents materials used, trains employees, and monitors application procedures and the disposal of biocides, equipment, and containers. All biocides are stored in a dedicated, locked building, that has adequate containment for possible spills (as required by 40 CFR Part 165) Application procedures, including rates of application, are reviewed by industrial hygiene personnel to assure compliance with registered pesticide requirements of the State of Colorado. No further action on use of biocides is indicated for CEARP Phase II.

<u>V.B.3.d.</u> Beryllium. The plant began production use of beryllium metal in 1958, and use of this material continues to the present. The total release of beryllium from stacks at the plant is less than 1 g/yr (AEMR 1985). By comparison, the allowable limit set by the EPA is 10 g/d per single source. Air pollution emission notices

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(APENs) have been submitted for all the plant's beryllium sources to the state as required by Colorado State Air Pollution Control Regulation No. 3

Rockwell International performed an assessment of beryllium levels in surficial soils near the plant in 1982 (Barrick 1982). This study was initiated because of the general lack of knowledge concerning beryllium levels in soils nationwide, and because surficial soils near the plant provided an integrated record of beryllium deposition from the plant's operations and other nearby sources. Identified possible sources included the plant, a beryllium ore industry 12 mi east of the plant, a beryllium ceramics industry 9 mi south of the plant, various coal producing or combustion sites nearby, and the heterogeneous geologic materials underlying the plant. This study indicated that no surficial soils near the plant have detectable beryllium accumulations, and that background beryllium content of surficial soils is dependent upon soil type.

Anomalously higher background beryllium levels were found near the plant's roads and buildings. The study concluded that the beryllium loading was attributable to surficial gravel aggregates which are higher in beryllium content. These aggregates have been increased by (1) adding sand and gravel for construction purposes, and (2) soil denuding from increased erosion around these construction sites (the clay is removed leaving the gravel aggregates).

The study found one area, 10 to 20 yd2, that contained beryllium accumulations above background that were attributable to plant operations. This area is located adjacent to Building 444, and Building 444 was used for beryllium operations. Maximum levels found were 114 micrograms per gram as compared to background levels of 1 microgram per gram. The study indicated that no health risk was suspected, but that removal of 1 yd3 of soil would bring the levels back down to background. No further action on beryllium operations is indicated under CEARP Phase II (Barrick 1982).

Y.B.4. Pathways for Environmental Release. The plant has three pathways by which material from plant operations can be released into the local environs. These three pathways are air, surface water, and groundwater.

V.B.4.a. Air Pathway, Materials (particulates and vapors) may enter the air pathway from stack emissions, open impoundments, and exposed soil surfaces. One example of airborne material transfer is the documented plutonium dispersal from the 903

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drum storage area (RFEIS 1980) Another example is spray from the 207 solar evaporation ponds (Sec. V A 3 h).

As described in Sec III A general windflow patterns surrounding the plant are well documented, and wind direction frequency data are included in the annual environmental monitoring reports. Annual average and accident atmospheric dispersion factors have been calculated to evaluate routine and unplanned releases at the plant (RFEIS 1980) Several ongoing studies of resuspension and plume dispersion are being performed at the plant (Hunt 1982, Hunt 1983, Hunt 1984, and Hodgin 1984) and a site-specific dispersion model is being developed for regulatory and emergency response to supplement atmospheric release advisement capability (ARAC) models (Hodgin 1985).

Currently, a data base on plant-wide releases of all stack emissions does not exist. Rockwell International is compiling a data base of all materials received, disposed, and used in product. This data base will enable rough estimates of air releases to be made from material balances. Any potential problem areas identified by this analysis will be evaluated, and if necessary, corrective actions will be implemented.

The air pathway has been adequately characterized and documented. Additional air pathway characterization studies will not be performed under CEARP

V.B.4.b. Surface Water Pathway. Sheet flow runoff from the plant (buildings, roofs, parking lots, storage and open areas) is collected in artificial and natural channels that eventually discharge into retention ponds in North and South Walnut Creek, and Women Creek. Bed sediments remain in the retention ponds, and most, if not all suspended sediments settle out rapidly in the retention ponds. Concentrations of contaminants, if present in solution in the retention ponds, are diluted by surface water or by effluent releases to the ponds.

Additional information regarding the surface water's pathway in relation to identified waste sites will be collected under CEARP Phase II. Surface drainage at the plant will also be characterized to more accurately determine run-on, runoff, and drainage destination of surface water from any given waste site. Additional measurements for hazardous pollutants (radioactive and nonradioactive) in surface water leaving the plant and areas upstream from the plant will be obtained under CEARP Phase II (this includes organics, metals, solvents, radioisotopes, etc.) These data will be used to complete under-

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standing of hazardous pollutants that may be entering the surface water's pathway, and to determine if a significant pollution hazard exists. If necessary, the surface water drainage will be followed upstream at least to the plant's property boundary to confirm and characterize the source of any hazardous pollutants.

V.B.4.c. Groundwater Pathway. Contaminants (liquid or solid) spilled on or buried in the ground at Rocky Flats Plant may be subject to resuspension and transport by water infiltration into the shallow aquifer. The rate of movement to the aquifer is highly dependent upon the nature and quantity of the contaminant and the hydrologic properties of the soil and substrata. Contaminants could be adsorbed by silts and If buried wastes are in contact with water, clays in the gravels that form the aquifer solution concentrations of the contaminant will vary based on contaminant solubility, contaminant concentration, and water contact time

Additional information regarding the groundwater's pathway in relation to identified waste sites will be collected under CEARP Phase IL. Additional characterization on depth, direction and rate of movement, recharge, and discharge of the shallow aquifer is needed. Additional groundwater data are currently being collected and will be evaluated to determine where additional data are needed for the characterization. This characterization will require relating the locations of all monitoring wells to potential contamination zones and evaluating the data for gaps and trends identifying locations that may require placement of additional monitoring wells. These dats will also be used to determine where and how fast groundwater moves in areas at the plant. This analysis will indicate which locations need to be sampled to adequately determine background levels and to confirm the presence or absence of any contributions from the plant to hazardous pollutants that may be present in local groundwater

V.B.S. Monitoring Program. The plant conducts an environmental monitoring program that includes sampling and analyzing airborne effluents, ambient air, surface water, groundwater, and soil. External penetrating gamma-radiation exposures are also measured using thermolyminescent dossmeters. The environmental monitoring program consists of collecting samples from onsite, boundary, and offsite locations. Ambient air quality, surface water quality, and groundwater quality measurements are also performed Specific details of the routine plant monitoring program are documented in the "Catalogue of Monitoring Activities at Rocky Flats' (RI 1985)

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Several federal, state, and local governmental agencies independently conduct additional onsite and offsite environmental surveys. The Colorado Department of Health samples air, soil, and water at the plant and in surrounding communities. It also operates an onsite, continuous, particulate air sampler for the Jefferson County Health Department. The DOE Environmental Measurements Laboratory (EML) conducts particulate air sampling at the plant and periodically performs special studies, including sediment and soil analyses.

The reliability and credibility of analytical laboratory results (quality control) are established by including as an integral part of any analytical procedure a program of scheduled replicate analyses of standard or spiked samples. The precision of analytical results is established as the standard deviation from true values or from the mean of replicate analyses. Accuracy is reported as the percent recovery of a constituent from a sample of known value with a given analytical procedure and analyst. In addition, the Rocky Flats Plant laboratory participates in the EPA and National Bureau of Standards' (NBS) quality assurance/quality control (QA/QC) audit programs each year. Second, the independent sampling by federal, state, and local government agencies allows for cross-comparison of data sets that have been independently collected and analyzed. This is an excellent external check of both sampling and analytical procedures (quality assurance)

V.B.5.a. Air Monitoring. The plant monitors air effluents for both radioactive and nonradioactive contaminants. Radioisotopes examined include plutonium-239, plutonium-240, uranium-233, uranium-234, uranium-238 and tritium. Each month a composite sample from each of the 43 exhaust systems is analyzed for beryllium Extractive instrumentation is being used to monitor for sulfar dioxide, total hydrocarbons, carbon monoxide and carbon tetrachloride in selected ventilation exhaust systems Also, continuous stack monitors measure oxides of nitrogen concentrations.

The plant has an ambient air quality monitoring station measuring all six EPA criteria pollutants: total suspended particulates, sulfur dioxide, carbon monoxide, ozone, lead, and nitrogen dioxide. The station is located in a mobile van. Except for ozone, the measured concentrations are below National Ambient Air Quality Standards. The measured ozone concentrations are similar to those found in the other areas of metropolitan Denver. The photochemical oxidant problem is an area-wide problem primarily caused by regional transportation sources. The contribution to this ozone problem from operations

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at the plant is small; the plant's input is primarily from commuter traffic to and from work.

The Colorado Air Quality Control Commission, in an effort to control ambient levels of ozone in the greater metropolitan areas, has placed more restrictions on volatile organic compounds. These restrictions, promulgated under Regulation 7, Part IV, Sec. C., of the Colorado Air Quality Control Act, may have increasing effects on the plant's use of solvents and on how releases of vapor from these solvents to the atmosphere are controlled.

The Colorado Air Quality Control Act requires the plant to have permits to operate its incinerators. These permits have emission limitations that require verification using continuous emission monitors. To qualify as a continuous emission monitor (CEM), it must undergo performance testing procedures that include EPA reference methods (manual tests) (40 CFR Part 60, Appendix B). These methods require sampling before, as well as after, the control device. This presents a unique problem at Rocky Flats Plant because the exhaust before the HEPA filter control device is radioactive. Due to the specialized nature of the reference method tests and the equipment it requires. Rockwell International will explore having these tests performed by an outside contractor who specializes in this testing or DOE will seek a variance from these procedures from the approprinte regulatory agency.

V.B.S.b. Surface Water Monitoring. Annual environmental monitoring reports at the plant show that radiological sampling of surface water is adequate both in frequency of collection and type of constituents analyzed (see Sec. IILE on water quality) (AEMR 1983, AEMR 1984, AEMR 1985). Data for some nonradioactive constituents have been collected; however, these data have not been given in the annual environmental monitoring reports. The plant will include data on nonradioactive materials in future annual environmental monitoring reports as per draft DOE order 5484.1. Sampling collection stations will be expanded to include background samples upstream from plant operations. The specific sampling locations and concentrations of PCBe for surface water will be identified in addition to those identified in past and present NPDES permits. The adequacy of the surface water monitoring program will be further evaluated under CEARP.

V.B.S.c. Groundwater Monitoring Annual environmental monitoring reports at the plant show that radiological sampling of groundwater is adequate both in

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frequency of collection and type of constituents analyzed; see Sec III E on water quality (AEMR 1983, AEMR 1984, AEMR 1985) Data for some nonradioactive constituents have been collected; however, these data have not been reported in the annual environmental monitoring reports. The plant will include data on nonradioactive materials in future annual environmental monitoring reports as per draft DOE Order 54841 Sampling collection stations will be expanded to include background samples from wells located upgradient from plant operations. The specific sampling locations and concentrations of PCBs for groundwater will be identified. The adequacy of the groundwater monitoring program will be further evaluated under CEARP.

V.B.5.d. Soil and Sediment Monitoring. Soil sampling for radionuclides from operational releases appears to be adequate in frequency and selection of constituents. Additional data have been collected from both Great Western Reservoir and Standley Lake to address plutonium concentrations in reservoir sediment as related to the plant's operations (Setlock 1983, Setlock 1985c). Sediment core profiles show plutonium concentrations peak at depth (past deposition), and indicate that no post-depositional migration is occurring in the sedimentary column (the plutonium is fixed to particulates at depth). Sedimentation rates vary from 0.5 to about 0.8 in/yr in these reservoirs.

Radioactive and chemical characteristics of sediment from onsite stream drainages and retention ponds are not reported in the annual environmental monitoring report. The plant has collected and analyzed samples both up and downgradient from the plant for radionuclides, specific trace metals, and organics that can be related to the plant's operations. These data will be included in future annual environmental monitoring reports as per draft DOE Order 5484.1. The adequacy of the soil and sediment monitoring program will be further evaluated under CEARP.

V.B.6. Documentation. Expanded documentation appears to be needed for several activities at the plant. In addition to indices of hazardous materials used onsite, inventories of hazardous materials purchased are being collected by the industrial hygiene group as part of OSHA requirements (hazardous materials standards). Disposal information is maintained, but this information has not been published. Summaries of these data will be included in the annual environmental monitoring report as per draft DOE Order 5484.1. These data will be used to demonstrate compliance with the various federal and state regulations governing releases of hazardous pollutants into the environment.

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V.B.6.a. CERCLA Reporting Requirements. Sections 103(a) and 103(b) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) require that the National Response Center be notified immediately when hazardous substances or oils are released into the environment in quantities equal to or greater than the reportable quantities set in Sec 102(b). When this law was established in 1980, reportable quantities were set at 1 lb for hazardous substances, except for those for which reportable quantities had been established pursuant to Sec. 311(b)(4) of the Clean Water Act (CWA) On Apr. 4, 1985, 40 CFR Part 302.4 adjusted the reportable quantities for many of the hazardous substances. Future monitoring activities at the plant will evaluate routine and accidental releases with respect to reportable quantities, and any releases exceeding these limits will be reported to the National Response Center. The anaulal environmental monitoring report will include a listing of reports made or a statement showing compliance with this reporting aspect of CERCLA.

V.B.6.b. NESHAPS Reporting Requirements. Asbestos was used in the older buildings for insulation in heating systems. NESHAPS (see Sec. IV) have emission control, disposal, notification and reporting requirements for removing asbestos. Delegation of authority to the State of Colorado for this national regulation is covered under Colorado State Air Pollution Control Regulation No. 8. Subcontractors for removing asbestos are required to provide appropriate notification to the EPA and State of Colorado. DOE will implement a procedure to document such notification.

V.B.6.c. Radiometric Survey of the Plant. A radiometric survey was conducted from 1975 to 1983, prior to new construction, to identify and remove surface radioactive contamination on the plant site. As radioactive material was discovered, it was removed. This survey has been documented by monthly memos-to-file, but a summary report has not been prepared. CEARP Phase I supplemental activities will compile these data into one report that lists all sites and identifies remedial action status. The report will demonstrate removal or absence of surface radioactive contamination (except for isolated locations within the 900 Area) or identify areas warranting further action under CEARP Phase II. Documentation for the cleanup necessary for remaining locations will be included in the plant's annual monitoring report, pursuant to draft DOE Order 5484 I. as significant environmental activities conducted at the plant site.

V.B.6.d. Underground Storage Tanks. The 1984 amendments to RCRA provide regulation for underground storage tanks used for oils or hazardous sub-

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stances, including radionuclides, currently in use or taken out of service in the last 10 years. This law requires notifying the state or local authorities of the age, size, type, location, and uses of each tank by May 8, 1986. A complete inventory of underground tanks at the plant showing dates of service, materials of construction, liquids stored, and current contents of the tanks is needed. Rockwell International is compiling the tank inventory.

V.B.6.e. Many and Photographs. Current aerial photographs and detailed scaled drawings of the plant site were not located during CEARP Phase I. If adequate maps and drawings cannot be obtained from subcontractors that have performed work onsite, a mapping exercise will be done under CEARP Phase II.

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APPENDIX B

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HAZARD RANKING SYSTEM AND MODIFIED HAZARD RANKING SYSTEM SCORES FOR ROCKY FLATS PLANT

B.I. General Information

The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA PL 15-510) requires federal agencies to identify to the Environmental Protection Agency (EPA) inactive sites under their control that may be sources of environmental contaminants. Such sites could include inactive waste disposal sites, facilities, or other locations that were contaminated by hazardous or toxic materials in the past. As one means of establishing the relative importance of such sites, the EPA promulgated the Hazard Ranking System (HRS) as Appendix A of 40 CFR 300. The relative ranking of sites at various installations can serve to highlight particular problems or suggest priorities for further investigation.

The HRS was designed by EPA to be used to "evaluate the relative potential of uncontrolled hazardous substance facilities to cause health or safety problems, or ecological or environmental damage" (Sec 1.0 40 CFR 300, Appendix A). The following excerpts from the regulation indicate some of the limitations of the system.

"The HRS is a means for applying uniform technical judgment regarding the potential hazards presented by a facility relative to other facilities. It does not address the feasibility, desirability or degree of cleanup required."

"The HRS does not quantify the probability of harm from a facility or the magnitude of the harm that could result, although the factors have been selected in order to approximate both those elements of risk. It is a procedure for ranking facilities in terms of the potential threat they pose..."

The HRS assigns three hazard mode scores to a site; (1) a Migration Mode Score that reflects the potential for harm to humans or the environment from migration of a hazardous substance by either groundwater, surface water, or air pathways; (2) a Fire/Explosion Mode Score that reflects the potential for harm from substances that can explode or cause fires; and (3) a Direct Contact Mode Score that reflects the potential for harm from direct contact with hazardous substances at the site. The score for each mode

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is obtained by evaluating a series of factors that characterize the potential of the facility to cause harm. Each factor receives a numerical value according to a predetermined scale; the factor values are weighted and combined to yield final scores according to set rules. The Migration Mode Score was used by EPA in establishing the National Priorities. List (NPL) of facilities in the private sector for initial attention under CERCLA. Federal sites are now proposed for inclusion on the NPL, and all sites with scores greater than 28.5 will be included. The Fire/Explosion and Direct Contact Mode Scores are intended by the EPA to identify facilities requiring emergency action.

The Migration Mode Score is a composite of the separate scores for each of the three migration routes; groundwater, surface water, and air. Each migration route score is calculated by multiplying selected factors for route characteristics, containment, waste characteristics, and potentially affected targets to arrive at a value on a normalized 0 to 100 scale. The overall Migration Mode Score is the root mean square of the three route scores, which emphasizes the highest scoring route, and is also on a 0 to 100 scale. Higher scores are expected to indicate a greater potential for problems. However, as suggested by the acknowledged limitations, the Migration Mode Scores are useful principally for ranking sites for priority of follow-up actions and do not quantify risk.

For many DOE installations there is a particular problem in applying the HRS to sites that may have radioactive contamination. The HRS does not contain provision for comparing radioactive materials with toxic and hazardous chemicals. As a result, DOE headquarters engaged Battelle Pacific Northwest Laboratories to develop a modification to the HRS that would more appropriately account for the relative risks of radioactive and nonradioactive contaminants. This modification was used in evaluating sites at the plant that contain radioisotopes

B.II. Summary and Conclusions

The Rocky Flats Plant was evaluated to determine the relative potential of hazardous substances to cause adverse effects on human health or the environment. The evaluation was conducted using the EPA Hazard Ranking System (HRS) for hazardous chemicals and the DOE Modified Hazard Ranking System (MHRS) and EPA HRS for radionuclides. The evaluation consisted of two steps (1) an overall evaluation of the risk of the plant relative to other National Priorities List (NPL) sites (Migration Mode Scores

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greater than 285), and (2) an evaluation of individual sites within plant boundaries to determine relative hazards

Because the plant is located on two separate surface water drainages with different public receptors, the overall evaluation consists of two aggregate scores created from lumping sites with common receptors together. Aggregated scores for the Walnut Creek drainage and the Woman Creek drainage were achieved by taking the worst case situation (e.g. compounds with maximum toxicity and persistence, minimum containment conditions, observed releases, and shortest distance to water users) from each of the sites and total waste quantities from all of the sites. This technique is consistent with guidance provided in the EPA Users Manual. The chemical Migration Mode Scores for the two aggregated evaluations of the drainages at the Rocky Flats Plant exceed the 28.5 threshold for placement of sites on the NPL. The Walnut Creek drainage received the highest chemical Migration Mode Score, 53 (see Table B.1). The hazard contribution from radionuclides is comparatively small (i.e. the radionuclide Migration Mode Score is 9).

Individual site hazard ranking evaluations were performed for the eleven sites with sufficient information to permit scoring. Six of the sites evaluated are waste disposal areas, four are potentially contaminated areas from prior waste treatment or storage activities, and one is the aquifer contaminated with volatile organic compounds (VOCs). The scores are summarized in Table B1. Of the eleven individual sites evaluated, only three (solar evaporation ponds, VOCs in groundwater, and present landfill) received scores which exceed the 285 threshold. The Direct Contact Mode Scores for all individual sites, except the solar evaporation ponds, are zero, reflecting adequate waste cover and site exclusion. The Fire/Explosion Mode Scores for all individual sites are zero, reflecting no apparent fire or explosion threat.

The Hazard Ranking Scores provide an estimation of relative hazard rather than a quantitative determination of risk. However, the scores do indicate that additional information should be collected under CEARP to fully evaluate potential risks to the public and the environment. The initial ranking of individual sites at the plant indicates that priority attention should be given to the solar evaporation ponds, VOC-contamination of the groundwater, and the present landfill. Rocky Flats Plant personnel are already involved in actions to reduce potential hazards from these sites and further characterize the VOC contamination plume. In addition, remedial investigation studies will be conducted during CEARP Phase II.

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Table B i Hazard Ranking Summary

Site	Tota Mig Mod	ration	Dire Con Scor	tact	Fire/ Explosion Score		
	Chem	Rad	Chem	Rad	Chem	Rad	
Aggregated							
Walnut Creek Woman Creek	53 40	9 6	17 0	0	0	0	
Individual Sites							
Solar Evaporation Ponds	46	7	17	0	0	0	
VOC in Groundwater	40	NA [®]	0	NA	0	NA	
Present Landfill	34	5	0	0	0	0	
903 Drum Storage Area	26	1	0	0	0	0	
Radioactive Site 800 Area	20	0	0	0	0	0	
Trenches T-1 to	17	6	0	0	0	0	
Reactive Metal Destruction Site	16	NA	0	NA	0	NA	
Original Landfill	15	5	0	0	0	0	
Cooling Tower Blowdown Ponds	12	NE	0	NE	0	NE	
Oil Sludge Disposal	9	NA	0	NA	0	NA	
Lithium Metal Destruction Site		NA	0 .	NA	0	NA	

a Not applicable

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b Not evaluated

Additional data will also be collected during CEARP Phase IIA field reconnaissance activities from sites with insufficient information for HRS/MHRS scoring. The site characterization data will be used to score these sites, and the data and scores will be published as supplements to the CEARP Phase I report.

B.H. Hazard Ranking System/Modified Hazard Ranking System Score Sheets.

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MAZANO RANKING SYSTEM/NEBIFIED NAZANO RANKING SYSTEM (MES/NORS)

HES/HARS SUPPLIES COVER SHEET

sift we	Appropated Walnut Creek
ritu eriai	Really Plate Plant
CPA MESICE:	AIII
PERSON(S) IN (WARE OF SITE: ME, Durar
	feebuell International, Operator
we of neviewe:	Kan Pan/Marji Norte, LAM. BATE: April 1986

CEMERAL DESCRIPTION OF THE PACILITYS

(for example: landfill, excluse impurdment, pile, sentainer; types of heterdoom undergroom; leastles of the facility; concentration route of exjer concentration route of exjer concentration route of experiences; types of information routed for rating; agancy action, etc.)

Great western Reservoir is the combine receptor. It includes the selen evaporation perso, vit in proundator, and present landfill,

		CHIMAN	WO I WET I'VE	MARITMAN
SCINES:		••••••		*** ***
	*	22 66	4.79	22 65
	192 4	44.99	12.07	44 19
	Seu .		, 2	** **
	10 •	9.00	• •	• ••
1	Sfe •			
		14.47	9.00	16.47

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SACLASMATER MOUTE MORESMEET Site: Appropried Weinut Creek

					_	**		MAX	267			
	*******		VALUE -			RATI PLISS	scort	SCORE	_	REFERENCES FOR EACH ASSIGNED SCORE		
	CATING FACTOR			`								
1	COSESSED SELEMBE	•		15	45		45	45		Mitrates and tritium feared in water seepage in militate		
	If Shorward Between In	-	m . te	ere of	45,	Present	te Line	4		north of solar pures (Guen 1973, Interviews 1966)		
	If theores telesse is	\$1w	m e 200	F7 0f	٩,	Proceed	to Line	1		(Solar Evap Perab)		
									1 2			
•	A Depth to Aquifor of		• •	_		2	•	•				
	Cansarh					•						
	8 Not Procipitation	• 1 2			•	1	•	,				
	C Permandility of the Undetweeted Zero	• 1 3	8 3	=	•	1	•	•				
	8 Physical State	• 1 8	2 3			1	•	3				
	TOTAL MOUTE CA	MACTI	M (ST10		ı		•	15				
3	CONTATIONENT	• 1 2	2 3	•	ı	1	•	3	1 3			
4	MATE CHARACTERISTICS								3 4			
-												
	Charlest									fear vote detected in grandeter (trisklerectly/me)		
	A facialty/Persistence	. 3	• • 12	15 18	16	1	16	18		tetrasklarastrytom; 1,1 diaktorastrytom;		
	1 Tererdae Vooto		2145		-	1		•		1 1,1 trighterestate (FE 1980))		
	Cartity	47	•							Tabletty 3 (Set): persistens 3. Volum unimen. Verst case semant. (VSE in Brancheter)		
	tediesetive						_			focal urunium 156 pCI/L; Tritium 20,000 pCI/L, there		
	A Postone Control	• 1	3 7 11	19	1	7 1	7	*		are the highest values excessed in walls (Solar Eves		
		21 3	-		_			*		Permit Insufficient date for evelypie.		
	8 Residue Potential	51 3	3 7 11 16	15 =	•	1	•	-				
	TOTAL WASTE CH	48467	12:57:6	3 1COA	•							
	.3176 95.15 07			HENT CA			24	*				
			140	CAE71 Y	ŧ		7	*				
•	TARGETS								3 3			
-	A Groundwater Vee	. 1	23		1	3	•	•		Assumed use for drinking water with elterrors source		
			4 8 10		10	6 1	16	4		evoluble Pfateres to restruct well 2000 ft to 1 min - Namet 10 restructs within 3 miles;		
	Well/Population	12 1	4 18 M)						pepulation served secured at 178 (3 8 people per well)		
	Served	× 1	» 12 H	40						(ACT IN GLANDINGS)		
	TOTAL TARGETS						22	49				
	. CALGRATION		•									
•	if Line 1 to 45, Ref	tight	1 = 4	g 5								
	If Line 1 to 0, MA				5							
	• • • • • • • • • • • • • • • • • • •	. •				1CAL	25740	57334				
				•	10	DVIT340	1730	57354	•			
7	7 UCBNALIZATION											
	Sivido Line 6 by 57531	,	Red tip				=	100 6	•	Wills III mere tot fvolunted.		
						M 190 ·		100	-			
						VE 500 -	17.07	100.0				
				N	W.L.	At plan .	₩.₩	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				

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· 32.

				VAL			MIL	MATI			M	•
	SATIMO FACTOR			•	-		VAL	PL IER	PCDRE .	scong	MC	SEPTIMENTS FOR EACH AND SHORT
1	CONCENSO MENTAND	•				45	45	• •	45	45	4 1	Mitrates and tritius found in unter seasons in hittains
	If Cheeres Selence !	• (114	•		حباه	of 45	, Presi	ed to Lir	• 4		north of pands (them & Steward Separt, p. 20, Lastr-
	If Observed Between I	• (#1 ~	•	• 4	صاه	of 0,	Press	TO LIA	2		Wirth Bagart, Fig 14, and Intervious 1984) (Setar Even Pares)
2	BOUTE CHARACTERISTICS										4 2	
	A facility slape and	•) 1	5	3			1	•	3		
	intervening ferroim)										
	8 1 yr 34 hr Esimfoli						-	1	•	1		
	C Distance to Secret	•) 1	5	3			3	•	•		
	Auriana Mater			_				•		3		
	9 Physical State	•	, ,	2	•		•	'	•	•		
	TOTAL MOUTE CHA	AAC	.70	119	/11C	1 100			•	15		
3	CONTAI MICHT	•	1		3		=	1	•	3	4.3	
4	WASTE CHARACTERISTICS										4.4	
	Chesteel											Four VOCs detected in transmister (trisiterectly/ame)
	A Testelty/Persistense					15 14			18	10		tetrachieroschylare; 1,1 dishieroschylare;
			•	_	4 3			. 1	•	•		1,1,1 (richlarusture (PE 1988))
	Curtity	• 1	' B									Testelly 3 (Bes); Persistance 3 - Volum ulbraus, Vorum come conduct. (VSS in Granductor)
	turi carrivo											
		. 1	1 3	7	11	15	3	- 1	3	*		1,100 pc1/1 45; 21 pc1/1 b; 6 12 pc1/1 Au; 6 18 pc1/1
		21	26	,								Am (ABHR 1902 86) (Solar Evep. Ponds)
	# Maximus Petential	• 1	1 3	7	11	19	•	1	•	*		
		21	*	•								
	TOTAL WASTE CHA	ACT		187								
						DI C	_		×	26		
_				M	.10	KTI	•		3	*	4.5	
5.	TAPETS			2			3	3	•	•	• •	Great Western Besomeir suplicipal uster supply
	A Surface Water Use 8. Distance to Sensitive	_	_	-	-		i					for Brougffold. In paraltine parisonments in
	feet remark	•	, ,	•	•		•	•	_	_		uras (BFE18 1983) - Blatume to reservoir 2000 ft to
	C Population Served/	1	, ,		8 10		*	1	35	4		1 offer production served over 10,000 (VCC in
	Distance to Motor	1	12	16	10 2							(randater)
	Intake Dourstroom	1		*	# 3	# 4)					
	TOTAL TARGETS S	الإذ	ĸ						44	75		
•	CALGRATICS			_		_						
	If Line 1 to 45, Make				_					M350		
	If Line 1 is 0, Malt	ipt	7	2 :	. 3 (2 4 1			51466			
							trient Me 10	MIT IN	7745			
7	CORPALIZATION											
	Sivies Line 6 by 64300	-	\$ W	mi t	ipt:							was as are such said
						_		l tem •		100 98		Mills of some for frequency
					1					100.00		
						•				100.00		

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ALE SOLVE WORK SHEET
                                                       Site: Appropried Walnut Crest
                           VALUE
                                      MIL MATE
                                                        MAX 857
      SATISM FACTOR
                                                                         #27540HCES FOR EACH ADDITIONS SCORE
                                      VAL PLIES
                                                SCORE SCORE SEC
1 GERRING MILEAM
                                                    8 45 5 1 to observed release; therefore, entire oir route
    Date and Locations
                                                                score is zero (VEC in Graumanter)
    Sampling Protocol:
    If Line 1 is 0, the to + 0. Enter on Line 5
    If Line 1 is 45, Then Proceed to Line 2
2 WATE CHARCTERISTICS
                                                             5 2
  Chartest
  A Reactivity and
                       . 1 2 3
      Ireasunt fail ity
  8 Tonielle
                       ....
  C Hozardha Waste
                      .12345
      Quent I ty
                      678
  Amil partive
                      0 2 5 8 12 16 20mg
          TOTAL WATE CHARACTERISTICS SCORE
                              CHICAL
                            MINISTINE
3 TARGETS
  A Population Within 0 9 12 15 10
      4 Mile Region
                      21 34 27 39
  8. Distance to Scraft 9 1 2 3
      tive Environment
  C Land time
                      0123
                                    TOTAL TANGETS SCHOOL
4 CALCULATION
    Builtiply 1 x 2 x 3
                                                    0 33100
                                    CHEFTCAL
                                    EVITSADION
                                                    9 35100
5 WERNALIZATION
    Divide Line 4 by 35100 and Rultiply by 100
                                   HOTE: HE share Not Evolunted.
                                 . .. ......
                                                  ....
                      SUPPLET CALBLATION OF TOTAL RIGHATION SCHOOL
                                              CHEMICAL MOTOMETTIVE
                                                .....
                                                4 9
                                                       12 00
  transacer bases
                         (Tax)
                                                ...
                                                       15
  Surface Veter Stude
                         (1<del>4</del>11)
                         (24)
                                                . .
                                                       . .
                                              M15 # 21.32
  he of learns
                                               91.74 15 21
  Squere Book of No.
                                               .... . ......
                                                             Square boot of the Sivided by 1.73
POTAL HIGHATIGH SCHOOL
                                                33.45 8.77
```

		DIRECT	CONTACT	MORKSHI	EET	Sites	1991	regated Matruit Creat
	BATING PACTOR	ANTRE SAWAS	MI M		score	accust aviz	w' mc	MITCHIGHTE FOR EACH APPLICATED SCORE
1	conteves succedary If cheerved insidumt If theoryed insidumt	8 45	of 45, of 0,	Proceed	te Line te Line	•		to speared instant of personal contemination or injury (betar Evap Pends)
z	ACCESSIBILITY	.123	1	1	1	3	. 2	Security start, but no berrier around perms (Seler- Ivap Perms)
3	CONTAINMENT	• 15	19	1	19	15	.,	Spon parks (Salar Evap Parks)
٠	WASTE CHARACTERISTICS							
	Crestent Testality	.123	3	•	19	15	• •	Pend & electropisting and electromitting unates used for analysis . Testelly of 3, foreignance of 3
	tediosetive	6 1 2 6 6 7 12 15	•	١	•	13		handed 100 500 pCI/1 elpho marinum mativity (Seler Evap. Pords)
,	TARRETS A Population Within a	812345-	•	•	16	**	• •	ingresisately 7 100 exployees excite within ore bile. (Solar Even. Perds)
	t site testus 8 Bioterno to 8 Critical Mabitat	6123	•	4	•	12		to critical habitet within use cite. (Selar Evep. Pends)
	TOTAL TABLETT	1000			16	32		
•	CALGRATION If Line 1 is 49, To If Line 1 is 6, To	Atiply 1 = 4 = 9	5					
	If time ties, we	acipy t 2 5 5 5	CHEST C			21466 21466		
	7 HORMALIZATION Divide Line 6 by 216	es and Rultiply b	y 100					
	DIAISE FIRE 4 of Fig.		DIENI CAL	1de •	16 67	100		MITE: ME more not frequented.
			CACTIVE			100 (*	
					14 47	100		

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DC44712

FIRE AND EXPLOSION VANCOUSET Site: Assessment Mainut Creat

	BATTING FACTOR	VALUE		PLIS	scme	MAE SCOME	DEF METERMICES FOR SACH ASSISMED SCORE
	OF METATO RELEASE			. 1		3	7 1 to paraminiz therefore, antire score is zero
•	marine account	•	•	•	•	•	(Seter Even Perm)
2	WATE CHARACTERISTICS						72
	A Sirect Evidence	• 3	=	1	•	3	
	8 Ignitability	0123	HE.	1	•	3	
	¢ feastivity	0123	=	ì		3	
	# Incorporability E Waste Guntity		-	'	•	•	
	-						
	Chapteol	. 1 2 3 4	10	1	•		
		3 6 7 8					
	Redissetive	. 1 2 3 5 6	• =	1	•	•	
	TOTAL WATE C	-	CS 900ME				
			CHETCH		•	*	
		w	IONETIVE		•	*	
	TARRETS						73
•	A. Pisteres to Morest	. 1 2 3 4 5	=	1	•	3	• •
	Population		_		-	-	
	8. Pistarus to Hourset	. 1 2 3		1	•	3	
	building						
	C. Distance to Serei-	6123	•	1	•	3	
	tive Environment		_				
	I Land Use	0123		1	:	3	
	2 Population within 2 Wile Codius	• 1 2 3 • 3	_	•	•	•	
	f. Suitdings Within	. 12345		1	•	5	
	2 mile Region		_				
	TOTAL TARGETS	10000			•	*	
4	CALGRATICS						
-	mittply 1 x 2 x 3						
			Codes	COL	•	1448	
			Meid	METIVE	•	1448	
	. HORNALIZATION						
•	Bivide Line 4 by 1440	and Maletaly	by 100				
			CHEMI CA	1fe •		100 10	sorts: 16 mayo ant Evolutral.
		1	MITSHOTON	8fe •	4 00	100 00	_
			MAY 1918	1 250 0		100.00	

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D044720

MAZAND RANKING SYSTEM/NEDIFIED MAZAND MARKING SYSTEM (MSS/NAME)

HES/HARS SAMUET COVER SHEET

-	Aggregated Water Cro	d				
FIELD GEFFERS	Booky flata Plant					
tra sesioni	ALLI					
P(RSGM(S) 10 (CHANGE OF SITE: POS,	•••	•••	 		
	feet	well intermetion	el Courster	 		
		• ••	••	••	••	•
	Can Bas/Rar Charts,		April 1986			

SENSOL DESCRIPTION OF THE PACILITYS

(for examples landfill, surface impoundant, pile, correleasy types of behardous substances intestion of the facility contamination route of major concerns types of information receives for rotings openny action, etc.)

This evaluation represents an approprian of those sites at Society Flots Plane that fall within the Surface drainage of thesen Creak. This approprian seems resemble because Standary Lake is the essen receptor It includes the VSC in granulator, the 955 drue storage eres, the original landfill, transmen T-1 to 7 11, reactive motel destruction site, oil sludge disposel, easiing tower bloodness parts and finding motel destruction site.

Ağe 1

acones:		CHEFTCH	MOTORETIVE	***
	••	39.46	5.73	» 4
	ter •	34.73	• #	34 73
	tm 4	16.10	0.70	18 16
	10 *	25.30	0.00	99 M
	31e e	0.00	• •	• ••
	***	0.89	• •	• •

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D044721

EFF.

CRCLADVATER BOUTE WORKSHEET Sites Appropriate Water Creek

		VALUE	*** 1			***	41
	RATING FACTOR	LAME	VAL	PL I CO	scond		MEC. NEFFENCIS FOR SACE ABBITMED SCORE
1	CONSTANT MELEVANI	0 45	45	1	45	45	3 1 VCC detected in prevalenter unadifiched 1985 dete
	If Observed Release In						(PC 1986b) (VBC in Groundwater)
	If Cheerval Selecte 1	e Elvan e Saart	of 0,	Process	to Line	2	
2	SOUTE CHARACTERISTICS						12
	A septh to Aquifor of Coreorn	• 1 2 3		2	•	•	
	8 Det Presipitation	. 1 2 3	•	1	•	3	
	C Permability of the		=	i	·	•	
	Unanterested Iene	• • • • •	_	•	•	-	•
	B Mysleel State	.123	-	1	•	3	
	TOTAL MEUTE CA	-	COME		•	15	
	CONTAINMENT	0123		,		3	33
•	CONTRACTOR	• • • •	-	•	•	•	••
4	WASTE CHARACTERISTICS						3.4
	Charles						Four VCCs detected in groundator (trishlaracthylane;
	A famicity/Persistance	3 4 9 12 15	18 18	1	10	18	tetrachierosthytera: 1,1 diminrostytera;
	1. Superdive Value	.12345		1			1.1.1 trightercodure (PC 19680))
	Questity	478		•	·	-	Tentetty 3 (Sen); Persistence mounted 3 - Volume universe. Service comment. (VSS in Groundator)
	tudioastive		_		_		
	A Residue theorysis	0 1 3 7 11 15	7	1	7	×	156 pti/L urunium in unit (27915 1980), (Original
		21 26		_			Landfill) Assume total 11 Cl plutenium (AFEIS 1988), (103 Brus
	8 Hastman Potential	0 1 3 7 11 15 21 26	'	1	1	*	Storage Area)
	****	MAACTERISTICS S					
	IVIAL BEIL CA				*	*	
		140 1046			7	*	
•	TARGETS					_	15
•	A franketer the	0123	2	3	•	•	Assumed use for drinking voter with sitemate source
		10	12	1	12	44	profitable Pistaran to moreot will I to 2 miles
	wil/Pendetles	12 14 18 20					About 50 rural walls within 5 alles; population served
	Served	****	1				engulated at 190 (3 8 people per unil). (905 brus Storess Ares)
	TOTAL TARGETS				18	40	
4	CALGRATIC						
•	If Line 1 to 45, to4	ciety t a 4 a 5					
	If Line 1 to 9, But						
			-	**	\$1066	17230	
			WHO	et i Vi	3470	37330	
7	HORMAL IZATION						
	Bivide Line 6 by 37330		CHANGE THE		¥ 73	100 00	MITE: ME mare but Prolucted.
			INT IN		7 #	100.00	
						105.00	
					~~~		

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D04472Z

*** ** ** ***

			VALUE		<b>MEL</b>	MATI			M	•
	BATIMS FACTOR		<b>U</b>		VAL	M.IO	10000	<b>ACUM</b>	***	REPTROMES FOR GACH ADDRESS SCORE
1	CENTRAL SECTION	•		45	45	) 1	45	45	4 1	Plutenius detected in surface voter (ASR 1984) (985
	If Choorved telesco !	. 41	•	Velus	of 45	, Prope	es to Li	no 4		163 the Stores tree)
	If Chearved Betrace is	. 61	<b></b>	Value	of T.	Prese	ed to Li	<b>~</b> ≀		
2	MOUTE CHARACTERISTICS								4 2	
	A. Facility Slape and	• 1	1 2 3			1	•	3		
	Intervening Terrain									
	0 1 yr 24 hr Rainfell	-			***	1	•	,		
	C Distance to Decreet	• 1	1 2 3		=	2	•	•		
	Surface Water  9 Physical State	0 1	1 2 3		-	1	•	3		
							_			
	TOTAL BOUTE CHAI	MET	(E 1 57 )		-		•	15		
3	CONTACUMENT	• 1	1 2 3		•	1	•	3	4 3	
4	WATE DWALTERISTICS								4.4	
	Chaptesi			_						Four VIIIs detected in groundator (tricklerently/ener
	A Textelty/Persistance (	3 (	J 9 12	l 15 :	. 18	1	18	16		terrunterestytem 1,1-diatorostytem
	8 Hotordays Vasto (	1 1	114	5	•	1	•	•		1,1,1 trichlorouters (PC 11880))
	bantity (	7 (	•							feeleity 3 (Sus); Persistence contact 3. Volume
	a									unareas. Worst new essected. (VSE in Grandwater)
	A. Resign Charves (		3 7 11		•	•	,	-		8.4 gET/L In Venus Creat - represents natural
		n a				•	•	-		bestgrand Levels (APR 1988 1984), (Original Landfill)
	•		3 7 11	1 16	•	1		24		Assume total 11 El plutantus (87918 1980) - Streen flow
		н			•	•	•	_		10 mbmt 1 x 10+9 (1ters per year (ther 1976)
	•	. –								Plus 44 payes desirted granius. (965 time storage
	TOTAL WAITE CHAR	-10	21 <b>87</b> 16	3 101						Arms)
			•		X.		×	*		
			140	IONETI	VE .		1	*		
5	TABLETS								4 5	
	A Surface Mater Use	-	1 2 3		1		•	•		Surface upter within 5 withs used for livesteet. to
	8 Distance to Sareltine	<b>e</b> 1	1 2 3		•		•	•		scraftly emirgrants in the area (8/816 1980).
	Environment	Δ.				_				Pistures to surface enter intake desertrous 2 to 3
	E. Population Served/			-	4	1	4	44		mites; engaged pendation between 1 and 100 people. This is the engaged pendation at risk from williging
	Platerus to Voter	-	16 15	5.	_					the Livestonk (90 case tiens 1 3 people per cas)
	Intelle Courstrous TOTAL TABLETS SE	-	<i>#</i> 4				10	75		(195 Brus Storage Ares)
_	CALGRATICS						~			
•	If Line 1 is 45. Reiti		1 = 4	5				44300		
	If Line 1 to 0, Rett	-			a 5					
				-		CAL	11700			
					14010	METIVE	490			
7.	HOPPALIBATION									
	Divide Line & by 64386 a	rd f	<b>Litt</b>	My by	100					
				C		, <b>-</b>		100.00		Wife III mare for frequent
						i 100 •	••••	100 00		
				1	WIN	* ***	10.15	100.00		

Recky Flate Plant CEARP Phase 1 DRAFT April 1996

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D044723

```
ALE BOUTE VONE SHEET
                                                         Situs Aggregated Venna Creat
                                      MIL MA. !!
                            VALUE
                                                         W 107
      BATTIME FACTOR
                                      VAL PLIER SCORE SCORE SEC
                            LANCE
                                                                           HEFERENCES FOR EACH ASSIGNED SCOME
1 CESTERVED RELEASE
                                       45 1
                                43
                                                    45 65 5 1 Greenved release (SFEIS 1980) (963 Srum Storage Aree)
    Sampling Protessis one SPEIS 1980
     If Line 1 is 8, the 50 . 8 Second on Line 5
    If Line 1 is 45, Then Present to Line 2
2 WASTE CHARACTERISTICS
                                                               4 4
   Charles
                                        1 1
   A Beartfuley and
                       0125
                                                                  Neterial present but deat not pase a hazard (LECIE)00
      Treasport falt I ty
                                                                  App. A, p. 48) (968 Brus Storage Arms)
   8 Testelty
                       . 1 2 3
                                        3 3
                                                                  Assured testelty 5 (985 from Storage Area)
   E Retarded Units
                                                                  Assumed maximum. (VEE In Grandwater)
                       012345
                                        4 1
       Countly
                       . . .
  Real section
                       0 2 3 8 12 16 20 0 1
                                                     1 20
                                                                  Arrest sir retesses 1 a 10 3 to small for a mile source
                                                                  (ABR 1988 1986) (988 Briss Starage Area)
          TOTAL WATE CHARCTERISTICS HORSE
                                4-1 CM
                                                    18
                             EVITSADIEM
3 TARGETTS
   A. Population Within 8 9 12 15 16
                                    21 1
                                                    21 30
                                                                  Population (surfuse) within 1 of termon 3 cet and
       4 Mile Region
                     21 24 27 30
                                                                  10 000 people (ASIR 1986). (955 Srub Storage Aras)
  B. Distance to Serei- 0 1 2 3
                                       . .
                                                     . .
                                                                  to scraftly confromments in area (RFE($ 1988)
      tive Environment
                                                                  (965 Strut Storage Area)
                                       3 1
                       0123
                                                   3 3
  C. Land Use
                                                                  Distance to represt industrial area < 0.25 miles
                                                                  (MIS From Storage Ares)
         TOTAL TANKETS SCENE
                                                    M 39
4 CALGRATICS
     Multiply 1 = 2 = 3
                                    CHEMICAL.
                                               19448 35100
                                    NOTINE
                                                   9 33100
5 SERVALIZATION
    Sivide Line 4 by 35100 and Ruttiply by 100
                                   HOTE: ME mare for Eveluated.
                                 MAXIMAN Se + 35 36 100 00
   ... ... . ... ... ... .. .. ... ..
                                                                        .. . .. .. .
                       SUBJECT CALBRATICS OF TOTAL RIGHATION NAME.
                                              CHEMICAL MOTORCTIVE
  translater face
                         (Igut
                                                 14 73
                                                        . .
  Surface later Basto
                                                 18 16
                          (1<del>000)</del>
                                                        0.79
                                                 95 M
                                                        . .
  Air Bares
                                               crur ur
  -
                                                        .
  Square feet of the
                                                44 11
                                                        7 91
                                                37 85 5 75 Square floot of the Sivided by 1 75
TOTAL HIGHATISM SCHOOL
```

Reschy Flate Plant CEARP Phase 1 DRAFT April 1966

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D044724

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THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE S

~**\$#** `

BIRECT CONTACT WORKSHEET Sites Aggregated Mason Creek SEL MATE WA PLIER SCORE SCORE MC. MFERENCES FOR EACH ASSIGNED 100MG 8 45 8 1 to excerved incident of personnel contemination 1 CHIEFVED INCIDENT If Charved Incident is tiven a bears of 65, Present to Line 6 If Charved Incident is tiven a bears of 6, Present to Line 2 or injury. (965 Stue Storage Area) 1 3 8 2 Semplty purely minimum surfess sever (193 Brus . 1 2 3 S VCCEREISIFILIAL Storage Area) 8 15 83 Adoquete surface cover. (985 Orus Storoga Area) . 1 3 CONTAINMENT 4 WASTE CHARACTERISTICS 0 15 8.4 . 1 2 3 Charlest facialty 1 Radioastive .1246 9 12 15 5 TARRETTS A Papalacton Within e 0 1 2 3 4 5 1 Mile testus 4 . 12 & Bistance to a Critical matrices TOTAL TANGETS SCORE 4. CALGRATICS If Line 1 to 45, materply 1 x 4 x 5 If Line 1 to 0, multiply 2 x 3 x 4 x \$ -BAD I COLCT I VE 7 HORMALIZATION Divide Line 4 by 21660 and Sultiply by 100 HOTE: ME soons bot froiunted. CHEFICAL SAF . 9 80 100 86 1 00 100 00 # 80 100 M -

Rocky Flate Plant CEARP Phase 1 DRAFT April 1906

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TELL TO LETTER THE THE

## FIRE AND EXPLOSION MERCENCET Size: Appropried Manual Creek

		VALLE	MIL 4			MAX	MP
	SATING PACTOR	· ·	WL I	n iet	<b>SCORE</b>	SCORE	SEC. PETENDICES FOR CACH AREI BIRED SCORE
1	SHAFFIND MILEASE		3 •	1	•	3	7 1 to securital therefore, online score is zero (903 - Drum Storage Area)
5	WATE CHARGETERISTICS						72
	A Birest Evidence	• 3		1	•	1	
	8 Ignitibility	0123	4	1	•	3	
	C Restivity	0123	**	1	•	3	
	• Incompatibility • Weste Quantity	0123	115	1	•	3	
	Chapteel	01234 5076	•	•	•	•	
	Self east (ve	. 1 2 3 5 4	• =	1	•	•	
	TOTAL MATE (	MAACTURI ST 1	1014				
		•	MEN CAL		•	**	
		1401	CHET I'VE		•	*	
3	1400279						7.3
	A Pietaroe to Bourast Propiation	*12345		1	•	3	
	9. Distance to Hourset Building	0123	•	1	•	3	
	C Distance to Surel tive Environment	0123		1	•	3	•
	1 Land Use			1	•	3	
	E. Population Within 2 Mile Radius	.12343		1	•	5	
	f Buildings within 2 Mile Andles	012345	•	1	•	5	
	TOTAL TARGETS	10mi			•	*	
4,	CALGRAFICE						
	metinty t a 2 a 5						
			CHEM CA	-	•	1448	
			MOIGHE	1118	•	1448	
•	WORRAL ( SATION						
_	Bivide Line 4 by 1446	and suitsfully i	by 100				
	•		-	fe •	• •	100 00	MITS: M more the frequentul.
		•	-	fe •	1 00	100 00	
			MARINE P	N .	1.00	166.60	

Backy Flats Plant CEARP Phase 1 DRAFT April 1906

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DO44726

gen - --

# HAZAND GAMEING SYSTEM/NEDSTRISD HAZAND GAMEING SYSTEM (MES/MINES)

### HET/HIRE RANGET COVER SHEET

SITE BOOK: Solar Evaporation Funds

FIELS OFFICE: Booky Flats Flant

SPA MEGICAL VIII

PERSON(8) IS CHANGE OF SITE: SOE, Curar

Resident International, Operator

most of mayindate. Kan ton/Marji Martz, LAML BATE: April 1986

MINIMAL MESCRIPTION OF THE PARTLETYS

(for example) landfill, surface immundance, pile, containers types of heterdance substances; lesseles of the facility; contamination route of anjor consents types of information readed for retings against action, etc.)

Salar properties pands A, B, and C. Combined total especity of 60 da10+6

liters. Martes assessions with releast borns. Lines with elsy, amphale-

count, and PHE Have Leaded. Contain a vide vertexy of unature including

souspe studge, nitrates, assertatus, plutanius, uranius, and tritius.

Haziatus resignastido europetration in p21/11 261 km ot 2 700; 230 Pu ot 2,000;

Total U et 14,000; and 30 et 6600 Resent data (Dape 1906) le used for teltius

to reflect the decay of this feetage, other data from EID.

CHRICIL MOTOMETTINE MAY 140.00 9Compt: 4.1 7.42 44, 14 34.73 . 34 73 78.01 6.16 70 91 . 1.40 . . 1.00 •.€ 0.60 16.47 . . 16.47

Realty Flate Plant CEARP Phase 1 DRAFT April 1966

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D044727

## SURFACE WATER SOUTE MORESHEET Sites Solar Evaporation Pords

		VA	w	W.	MATE		***	<b>M</b> F	
	EATING FACTOR	e.		VAL	PLIES.	SCOME	SCURE	200	AMPERIMICES FOR SACY ADDITIONS SOME
,	CHARLES CONTRACT	)	45	49	-	45	45	4 1	Signatus and prigius found in water seepage in hitiside
•	If Opporved Release Is	given	. Volum	of 45	, Present	d to Line	4		morth of purch them & Stouped Squart, p. 20; Law-
	If Cheervad Release Is	-	. Value	of G,	Proces	d to Line	1		Wirth Separt, Fig 16, and Interviews 1986) This
									scoring reflects guidanes from page 29 MS Users Heruni
ŧ	BOUTE CHARLETERISTICS				_	_	_	4 2	(SPA 1985)
	A facility flags and	. 1 2	1		1	•	3		
	intervening formein		_						
	s 1 yr 24 hr. Sainfell				1 2	:	3		
	C Distance to Hourant	• 1 8	3	•	•	•	•		
	surface Water a Physical State	. 1 2		•	1	•	3		
	a wherest sense	• • •	•	-	•	•	-		
	TOTAL BOUTE CAN	METER	971CA 30			•	15		
				•	1	•	3	43	1
,	CONTAI WHENT	• 1 2	• •	-	•	•	•	•	
								4 4	
•	Charles		•						
	A Testelty/Persistance		P 12 19 1	. 1	. 1	18	16		migh nitrotes; penelbie ekramates and heavy estela;
		. 1 2			8 1	•	•		mended waret one (fasiety 5, Persistence 5)
		478							Adolated the fill volum of pirel (over 10,000 drum)
	•								This easing reflects guidance from sage 36 MS Users Report (SPA 1986) and SETMS Training source.
	Redissetive					_			1100 pt//L 45; 21 pt//L b; 6 12 pt//L Pur 6 16 pt//L
	V*		7 11 15		3 1	3	•		An (April 1982-1984).
		21 25			• •		*		Assumed total release to 8 Volume Creek; 48 6 8-6 L.
	8 Resident Patential	• • •	7 11 15		• '	•	_		14 000 pt/A by 2,000 pt/A Pay arrust flow 6 1 E-8
		21 💥							(RFEIS 1980) This method use used because it is
	TOTAL WASTE CIM	METER	#FICE #6						e realistic warst asso and the MMMS formula on page
	10/22 05/11 055		CHERT			*	*		C 7 bruft HRR Harry Harratt is for selid usets (Phone
			RAD I GACT	IVE		3	*		communication with PAL; March 25, 1966).
	5 TARGETS							4	Second Mantaria Sasservair marietipal vactor supply for
	A Surface Motor Use	• 1	5 3		3 3	•	•		Broomfield. So completes environments in oras (67615
	8 Distance to Sansitiv	• • 1	2 3		• 2	•	•		1980) Distance to reservoir 1 to 2 miles; possistion
	Envi remant					39			served over 10 000. This searing reflects guidance
	C Population Served	• -	6 8 10		<b>1</b>		_		from page 36 to 30 MS there Harant (SPA 1984)
	Pietares to Water		14 16 27 28 28 28 28 28 28 28 28 28 28 28 28 28						
	Intake Deurstrass			-		39	35		
	TOTAL TABLETS								
	6 CALGRATICS If Line 1 to 45, Rule	elate	4 . 1	)			MICH	)	
	If Line 1 to 6, The	tiely	2 = 3 = 4						
	,, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			CHE	HT CAL	43430			
				W	IGNETIVE	1246			
	7 HORMALIZATION								
	Divide Line & by MADE	<b>•••</b> 1	withly i	<b>100</b>		. 7.9	100 0		MITS IS some for frequency.
				CHEMI	<b>CL T</b>		100.0	-	
			W		141 <b>h</b> u 141 <b>h</b> u		100 0		
				700					

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Ready Flate Plant CEARP Phase 1 DRAFT April 1806

DC44712

ite: Solar Eveneration Ports

	RATING FACTOR	PALLE		MATE PLIER	score			, ng/engices for then mellines sente
1	CESERVED INCIDENT  If Chearved Incident  If Chearved Incident	10 61van 8 8	is o ware of is ware of 0,	, Present	e to Line to Line	•	8.1	to observed incident of personnel contamination or injury
2	ACCESSIBILITY	0123	1	•	1	3	. 5	Security quard, but no barrier around pands
3	CONTAI WANT	•	15 15	1	15	15	• 3	Open parks.
4	WASTE CHARACTERISTICS							
	Chaptest Textetty	.123	3	•	15	15	• 4	Texticity of 3, persistence of 3.
	Redistative	0 1 2 4 4 7 12 15	•	1	•	15		Voed marifests electred levels (SPEIS 1988)
5	TARRETS A Population Within a	.12345	•	•	16	*	4 5	Approximately 7,000 various araise within one atta
	1 Hito Redict 8 Distance to 8 Critical Rebitot	. 1 2 3	•	4	•	18		to eritical habitat within are oile.
	TOTAL TARGETS	*****			16	×		The opening on this variablest reflects guidance from pages 57 to 66 this Users Runal. (874 1964).
٠	CALGRATION If Line 1 is 45, Mai If Line 1 is 0, Mai	itiply 1 ± 4 itiply 2 ± 3	E 4 E S	CAL METIVE	3446	21466 21466		
,	STUID LING 6 by 2168		MƏTIMICƏ VITBADI OLU		14 47 6 98 14 47	100 d 100 d 100 d		MIT: M more to: fvelusted.

### FIRE AND EXPLOSION MORESHEET Sites Setor Evenoration Funds

				VALL			mt.	MATI		MX	467	
	EATING FACTOR			AM	1		44	PL 100	SCORE	<b>ICOM</b>	MC	REFERENCES FOR EACH ASSISSAID SCORE
	CHENTO MILEASE	1			;	3	•	1	•	3		to potential; therefore, entire score is zero. This score reflects guidance from page 49 MS Usero
2	WASTE CHARACTERISTICS	_				_	_		•		7 2	Maruel (SPA 1986).
	A Birest Evidence	•		-			! !	1	•	3 3		
	8 ignitability C Reactivity		_	-			_	,	·	•		
	0 (respectibility		_	-			_	ì		i		
	E Vente Burntity	•	•	•		•	•	•	•	•		
	there eat	• 1		1	•		•	1	•	•		
		, •	• •	•								
	tedfeastive	• 1		3 1	4	•	E	1	•	•		
	TOTAL MASTE (	w	LET	1011	710	5 1CE						
					6	HEN C	M		•	*		
				•	<b>1</b>	<b>CAET</b> I	W		•	**		
											73	
3	TARGETS A. Bistarus to Mearast				•			•		,	, ,	
	Pendetion	•	•	•	•	•	•	•	•	•		
	8. Sistante to married	• 1		1				1	•	3		
	britding	•	•	•			•	•	•	-		
		. 1	1	3		1		1		3		
	tive invirument											
	9 Land Uto	• 1	1 2	3			•	1	•	3		
	E Population Within	• 1	1	3 4	• 5			1	•	•		
	2 atto testion							_	_	_		
	F. Buildings Within 2 Mile Radius	• •	1 \$	3 4	• •	•		1	•	•		
	TOTAL TARGETS	100							•	*		
	CALCIALITE											
•	Mutiply 1 x 2 x 3											
						c		•	•	1440		
						•	<b>M</b> I	METIVE	•	1446		
,	UCRNAL 1247160											
	Bivide Line 4 by 1448	•		tel	My							mate. His array was displayed
								<b>9</b> 60 •	• •	100 00		mgTE: ME means not Evolusted.
					•			# + + + + + + + + + + + + + + + + + + +		100 00	-	

Rocky Flats Plant CEARP Phase 1 DRAFT April 1906

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. . . .

### MAZAND BANKING SYSTON/HOSIFIND MAZAND SANKING SYSTON (MIS/HURS)

#### HEE/FREE SHOWET COVER SHEET

SITE MARE: VOC IN Grandweer FIELD OFFICE: Souty Floto Plant OPA REGION: VIII NAME OF SEVIENCE: Ken top/Nor]1 Norts, LAM. SATE: April 1986 (for example: (andfill, surface impagnizant, pile, container; types of humanists adorteous; leastin of the facility; contemination route of outer concerns types of information readed for retings opening entire, etc.) VIC has been detected in the earlieful equifor or leady floor Plant. ** ** * * ***** **** To producte this site, tesisity, persistance, and quantities were exclusived. press will give a very assumetive SSS cours for this site. This apprecial will give a very screenwalive MMS scare for this site. ----.... Contamination was executed to extend to the reserved surface unter drainings, and secured provided provided of scharge to surface actor. ... . . ... ... .... .... .... 

		CHEFFOR	CAD TORETTY	THE PART
107701			****	•••••
	•	10.30	1.00	44.30
	<b>Spr •</b>	44 110	0.00	4.10
		13 <b>13</b>	• •	27.28
	<b>30 •</b>	0.00	1.00	0.00
	afe •	• •	0.00	• •
	140 •	0.00	0.00	0.00

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My A T A N C T T TO THE TOTAL THE TOTAL TO T

-85

#### COCADNATER AGUTE SCHOOLS Size: VCC in translator

		VALUE	1EL	MATI		<b>W</b>	<b>16</b> 7	
	SATING FACTOR	tares.	VAL	PL189	10000	10000	100	METEROMERS FOR EACH AND INCOME
1	COSCRIVED MELEAGE	. 45	43	1	45	45	3 1	Four VECs detected in groundator (triphiprostivitate
	If Charrest Bateans	le Bluen e Seere	of 49,	Proceed	to Line	•		totrashiarasthylator 1,1 dishiarasthylara
	If Cheerved Release !	o Given e Seere	of 6,	Present	to Line			1,1,1 trichterouders (PC 1988)) This seere reflects guidence from page f 889 Upons Servet
2	SOUTE CHARACTERISTICS						1 2	(874 196).
-	A Bepth to Aquifor of	0123	•	3	•	•	•	
	8 Not Procipitation	0123	-	1	•	3		
	C Permentility of the	6123		1	•	3		
	Unconstant Large							
	9 Physical State	0123		1	•	3		
	TOTAL ROUTE CO	MALETERISTICS O			•	15		
3	CONTAINMENT	0123	-	1		3	,,	
4	WASTE CHARACTERISTICS		•				3 4	
	Chaptast							
	A Textel ty/Persistance	0 3 4 9 12 15	18 18	•	10	16		Textelty 3 (Sex); Persistence season 3.
	1. Reportus VISTO	. 1 2 3 4 5	•	1		•		Volum urbrane. Harry seas tended.
	Quart i ty	476						This searing reflects guidance from page 17 MSS Usero- Remail (SPs 1986).
	Redissative	<del>-</del>		_	_			
	A. Recime Guerral	01371115	-	1	•	×		
	1 Hasiman Potential	21 26	_			-		
		51 39		•	•	-		
	TOTAL MARTE CO	MARCHISTICS S						
	14140 00018 64				*	26		
		and long			•	*		
5	TARGETS				-		3 5	
•	A travalenter Use	.123	1	3	•	•	- '	Accused use for drinking water with alternate source
	8 Sistance to Heartist	0 4 6 8 10	16	1	16	44		evoluble. Pletares to reservet well 2000 ft to
	Vall/Papulation	12 14 18 20						1 ofte - About 30 rurel walls within 3 after;
	Served	****						propulation corved consent at 190 (3 8 propie per voll). This couring reflects guidence from pages 34 to 27
	TOTAL TANGETS	1446				49		MIS Users Hernel (SPA 1984),
4.	CALGRATIC							
	If Line 1 is 48, Rul	tiply 1 = 4 = 5						
	If Line 1 is 0, Mul	tiply 2 = 3 = 4						
			CHURCH!	_	25746	37780		
_			-		•	57500		
7	MATHEMATICAL PROPERTY AND ADMINISTRATION OF THE PERSON OF							
	Divide Line 6 by 37398		, 144 Hillian	-	4.9	100 00		MITTER ALL COURSE CONTROLS CONTROLS
			CAST IV		1.00	100 00		
						100 00		
				-				

Mocky Flats Plant CEARP Phase 1 DRAFT April 1906

Appendix B, Page-15

DO44734

## SURFACE WATER ROUTE VORCEMBET Site: VOC in Groundwater

Company Station   Company   Compan				VALU	•	MEL	164,11		1942	**	
## Commenced Sections is divisor in Visions of 6, Pressent to Line 2  ## Relitity Stage and 6 1 2 3 0 1 0 3 3    Interventing Torretin		MATING FACTOR		<b>L</b> /mi	•	ANT	PLIM	acont		MC	PEPENNICES FOR GACH ASSISTED SCORE
## Commenced Sections is divisor in Visions of 6, Pressent to Line 2  ## Relitity Stage and 6 1 2 3 0 1 0 3 3    Interventing Torretin	t	COSTEVED NELEASE	•		45	•	1	•	45	4 1	to electrical release. This score reflects evidence
2 SMITE CAMPLETERS STATE  A FIRST TYPE Stage and 8 1 2 3 0 1 0 3 3 for manuface rules (commercial content of the product of th		If Charred Release	. 614	~	Yelus	of 45	, Press	ed to Lir	• 4		
## A Partity stops and ## 1 2 3		If Charves Beloase	la Giv	~	Yelus	of 9,	Press	ed to Lir	<b>~</b> 1		
Interventing Torrein	2									4 2	
### 1 To 1		A facility Stape and		123	3	•	1	•	3		to surface noted (subsurface site) Hit not designed
C Distance to Secret  Burface storm  Difference		Intervening Terrel	•								for manuface sites; page 27 MRS Users Maruel (EPA
### Description State ### Physical State ### 12 3 3 1 3 3 3 Assessed wave range galaxiese from page 32 and tourn name #### TOTAL NAME CHARACTERISTICS SERIES #### 0 1 2 3 3 1 3 3 3 Assessed wave range, and ret designed for manufacture ##### WATE CHARACTERISTICS ##### CHARACTERISTICS ##### CHARACTERISTICS ####################################		0 1 yr 34 hr Reinfel	1	1 2 3	i	1	1	1	3		1986) 26 hr reinfelt 1 2 in (Fig. 8, ASCIRSOS AND
### TOTAL SMITE CANAACTERISTICS SOURCE    TOTAL SMITE CANAACTERISTICS SOURCE   10 19		C Bistanes to Hearest		1 2 3	1	3	5	4	4		A) Horsk Wolfact Crock chant 700 ft may This
TOTAL NAME CHARACTERISTICS SOURCE   STATES   State		Burfoos Water									couring reflects galdance from page 32 and Upors Republ
3 CONTAINMENT 0 1 2 3 3 1 3 3 4 5 Assessed weret case, after not designed for independ ng for independent formatting formatting for independent formatting for independent formatting formatting for independent formatt		9 Physical State	• 1	2 3	1	3	1	3	3		(SPA 1984). Motorial fe a liquid.
Second Comment   Seco		TOTAL MOUTE CH	MACTE	R: 97	108 10	100		10	19		
## Contest Contest  ## A Trailer try/Pervistration 0 3 6 9 12 15 18 10 7 10 16 Trailer try/Pervistration 0 3 6 9 12 15 18 10 7 10 16 Trailer try/Pervistration 0 1 2 3 4 5 8 1 8 4 Wolden uniform. Notes cancered 3.  ## A Residence trial	3	CONTAI MINNET	• 1	2 3	ı	3	•	3	,	4 3	Assumed worst case. 400 not designed for extensions
Chestest A Testelty/Pereletance 0 3 6 9 12 15 18 18 1 18 1 18 16 Testelty/3 (Stat); Pereletance assumed 3, 9, Reservation Masse 0 1 2 3 4 5 8 1 8 1 8 4 Welcan information. Worse case assumed 3, This essenting reflects guidance from page 34 mtg Usero Residential Masses (SPA 1984),  Residential Reservation 0 1 3 7 11 19 mtl 1 9 26 26 27 28 28 29 29 29 29 29 29 29 29 29 29 29 29 29											situs; page 34 48 Hoors Novel (SPA 1994)
A Testistry/Persistence 0 3 6 0 12 15 18 18 1 18 15  B. Reserring Name  Control to the control time	•	WASTE CHARACTERISTICS								4 4	
9. Reservices blance 0 1 2 3 6 5 6 1 8 8 Working understant there can assume.  Confidential blance of 7 8 Part 1 19 26 Part 1 19 26  3. Resident blance of 1 3 7 11 15 all 1 0 26  21 26  3. Resident Persential 0 1 3 7 11 15 all 1 0 26  TOTAL WATE COMMACTRISTICS SIGNE  CORNICAL 20 20 20  S TARRETS 4 Surface batter labe 6 1 2 3 3 3 9 9 Great blance of majority after angely for Proceedings of the confidence of the 2 3 0 2 0 6 For Proceedings of the confidence of the confidence of the 2 3 0 2 0 6 For Proceedings of the confidence of		Chaption									
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Testing Classifier   Testing		S. Hospirdowa Waste	. 1 1	3 4	5	•	1	•	•		Volume urbroads. Moret come minutest.
Total substitute		<b>Quantity</b>	674	1							· · · · · · · · · · · · · · · · · · ·
21 36  3. Passings Potential 0 1 3 7 11 19 85 1 0 26  TOTAL WASTE CHARACTERISTICS SOCKE  CHENICAL 26 35  AND IGNATIVE 0 26  5 TARRETS 4 5 5  A Surface Noter Use 0 1 2 3 3 3 9 9 Secret Vestors Reservoir cursicipal vator supply 8 Distance to Sensitive 0 1 2 3 0 2 0 6 for Securified. To consistive environments in area (SPEIS 1985) Distance to reservoir 2005 for to 8 Private Servoiry 9 6 6 8 10 35 1 35 40 1 oile; passitive normal over 10,000 This secring 9 Distance to Vator 12 16 18 28 reflected servoir passes 34 to 35 92 35 40 (SPA 1985)  10 CARRETS SOURCE 4 5 5 4 4 2 5 (CRA 1985)  17 Line 1 1c 45, multiply 2 x 3 x 4 x 5 (CRA 1985)  17 Line 1 1c 45, multiply 2 x 3 x 4 x 5 (CRA 1985)  27. ADMILITATIONS  Bivide Line 6 by 64286 and multiply by 168  COUNTERL, Yes 8 95 35 108.00 ADMINISTRATIONS  Bivide Line 6 by 64286 and multiply by 168  COUNTERL Yes 8 95 35 108.00 ADMINISTRATIONS  Bivide Line 6 by 64286 and multiply by 168  COUNTERL Yes 8 95 35 108.00 ADMINISTRATIONS  Bivide Line 6 by 64286 and multiply by 168  COUNTERL Yes 8 95 35 108.00 ADMINISTRATIONS  Bivide Line 6 by 64286 and multiply by 168  COUNTERL Yes 8 95 35 108.00 ADMINISTRATIONS  Bivide Line 6 by 64286 and multiply by 168  COUNTERL Yes 8 95 35 108.00 ADMINISTRATIONS  Bivide Line 6 by 64286 and multiply by 168  COUNTERL Yes 8 95 35 108.00 ADMINISTRATIONS  Bivide Line 6 by 64286 and multiply by 168  COUNTERL Yes 9 95 35 108.00 ADMINISTRATIONS  Bivide Line 6 by 64286 and multiply by 168  COUNTERL Yes 9 95 35 108.00 ADMINISTRATIONS  Bivide Line 6 by 64286 and multiply by 168  COUNTERL Yes 9 95 35 108.00 ADMINISTRATIONS  Bivide Line 6 by 64286 and multiply by 168  COUNTERL Yes 9 95 35 108.00 ADMINISTRATIONS  Bivide Line 6 by 64286 and multiply by 168  COUNTERL Yes 9 95 35 108.00 ADMINISTRATIONS  Bivide Line 6 by 64286 and multiply by 168  COUNTERL Yes 9 95 35 108.00 ADMINISTRATIONS  Bivide Line 6 by 64286 and multiply by 168  COUNTERL YES 9 95 35 108 95 35 108 95 35 108 95 35 108 95 35 108 95 35 108 95 35 108 95 35 108 95 35 108 95 35 108 95 35 108 95 35 108		testionative									
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TOTAL WATE CHARACTERISTICS SSENS  CHEMICAL 36 36  RAGIOACTIVE 0 36  S TARRETS 49  A Surface water two 0 1 2 5 3 3 9 9 9 Breat Vestors Reservoir manicipal water supply 8 pistures to Servicive 0 1 2 5 0 8 0 6 for Sreamfield. To sensitive environments in area (SPIIS 1980) Distance to reservoir 2000 fr to area (SPIIS 1980) Distance to reservoir 2000 fr to 1 oriest parameters across over 10,000 This secrity 9 interes source 36 30 32 35 40 (SPA 1906)  10 the Description of 45, Ruttiply 1 x 4 x 5 (SPA 1906)  CHIROLATION (SPA 1906)  CHI		1. Resigna Petential	. 1 1	71	1 15	-	1	•	24		
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CHRICAL 25 36  RAPIGACTIVE 0 36  5 TARRITS											
A Surface total time 0 1 2 3 3 3 9 9 9 Seret Metern Reservoir conleiped vator apply 8 platance to Sensitive 0 1 2 3 0 2 0 6 for Presential. The constitute on 1 2 3 0 2 0 6 for Presential to constitute on 1 2 3 0 2 0 6 for Presential to Constitute on 1 2 3 0 2 0 6 for Presential to Constitute on Presentation of Constitute on 1 2 3 10 18 20 for the constitute on 1 2 3 10 18 20 for the Constitution of Constitution		TOTAL WATE CON	JUST CO.								
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A Surface tator too 0 1 2 3 3 3 9 9 Great Matter Reservoir cantelpol unter supply 8 Platares to Sensitive 0 1 2 3 0 2 0 6 for Promified. So carefully environments in 8 Prince Servery 0 6 6 8 10 35 1 35 40 1 oile; papelet in server 10,000 file serving 9 Platares to Mater 12 16 18 20 reflects puldares from pages 36 to 30 185 Users Neglect 10 Intake Depretures 36 30 32 38 40 (GPA 1986) 10 Line 1 10 45, Ruttiply 1 x 6 x 5 (AMSO 17 Line 1 10 0, Ruttiply 2 x 3 x 4 x 3 (CMSIGNITIES) 10 Line 1 10 0, Ruttiply 2 x 3 x 4 x 3 (CMSIGNITIES) 11 Line 1 10 0, Ruttiply 2 x 3 x 4 x 3 (CMSIGNITIES) 12 Server Material Server 10 and Ruttiply by 100 (CMSIGNITIES) 13 Server Material Material Material Server 10 and 100 and 1					( CANST	W.		•	-		
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Sevicement  C Population Servely 9 6 6 8 10 38 1 38 40 1 oile; papulation servel over 10,000 fit to 1 oile; papulation servel over 10,000 fit is serving reflects polarize from pages 36 to 30 100 Union for the pages 36 to 30 Union for the pages 36 to 30 Union for t						•	-				
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Pisteries to leter 12 16 18 28 reflects guidance from pages 34 to 30 life Usors natural Intels Description 34 30 32 35 40 (CPA 1904)  TOTAL TARRETS SIMMS 44 39 6. QUARANTOS:  If Line 1 is 45, Subtigly 1 x 4 x 5 (CRETION) 34.800  QUARANTOS:  QUARIENT 34.800  QUARANTOS:  P. MEMORIZATIONS  Divide Line 6 by 64.300 and Subtigly by 100  COUNTAGE, Same 9 35 35 105.00 ANTEL SE SUBMINION STEEL SE SU		•				_		-	40		
Intake Secretives 34 30 32 35 40 (DA 1904)  TOTAL TARRETS SINS 44 50  6. OLIGICATION  If Line 1 in 45, matriply 1 x 4 x 5  CHORDER 34300  OMIGNATION  OMIGNATION  F. HERMALIZATION  DIVIDE LINE 6 by 64300 and matriply by 100  CHORDER 100 0 100 64300 and matriply by 100  CHORDER 100 0 100 40300 and matriply by 100  CHORDER 100 0 100 40300 and matriply by 100  CHORDER 100 0 100 400 100 400 400 400 400 400 4					. •	-	•	-	-		• • • • • • • • • • • • • • • • • • • •
TOTAL TANKETS SEEMS  6. GLIGRATICS  17 Line 1 to 45, Nattiply 1 x 4 x 5  CHOICAL 3480			-	-		_					
6. QUERATION  17 Line 1 to 45, Nuttiply 1 x 4 x 5  17 Line 1 to 9, Nuttiply 2 x 3 x 4 x 3  CHOIGNEL 34500  QUOIGNETIVE 0  7. WERNALIZATION  DIVIDE Line 6 by 64300 and Nuttiply by 100  CHOIGNEL THE CHOIGNE AND MARKET SET OF SET			-	-		•			-		
If Line 1 is 46, matiply 1 x 4 x 5  If Line 1 is 9, matiply 2 x 3 x 4 x 5  CHRIST SALES  ONDIGETIVE 0  7, MERITALIZATION  Divide Line 6 by 64300 and matiply by 160  CHRISTA Sale 0 180 480 AND								_	-		
If Line 1 is 0, Ratifply 2 x 3 x 4 x 3  CHOICAL 3430  GROUNTINE 0  7. HORNALIZATION  Divide Line 6 by 64300 and Ratifply by 160  CHOICAL Tax = 35 35 160.00 ANTE: 35 manual for Evaluated.  AMPLIANTINE Sour = 0.00 160 00	•								44.000		
CHOICEL 34.000  CHOICELTING 0  7. ADDITION STOP 64.300 and Rultiply by 160  CHOICELTING 100 0 107 64.300 and Rultiply by 160  CHOICELTING 100 0 100 400 400 400 400 400 400 400 4						- •					
QUOI CONSTITUTE 0  7. ASSESSED LIFE 6 by 64300 and Relativity by 160  CHISTORY 100 - 15 35 160.00 ASTEL 12 TRANSPORT  AMOUNT INC. 100 - 0.00 160 00		17 C100 1 10 0, 100	i pra	4 .			-				
P, MEMBELIANTONS  STYTED LINE 6 by 64300 and Ruttiply by 100  CHEMICAL THE + 16 35 100.00 MITEL SE UNION BOTTLE SE UNION BOTTL						•					
Sivide Line 6 by 64300 and Ruttiply by 160 CHRISEL Sac + 16 35 160.40 ASTEL SE SEAL SEAL SEAL SEAL SEAL SEAL SEAL								•			
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AMINETIVE Sau . C. 60 100 00		**************************************		- T							stills. If your list franchist.
					_			~ =			
									10.0		

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AIR BOUTE WORK SHEET dite: VCC in traumbeter ML MATI -BATTUR FACTOR VAL PLIER SCORE SCORE SEC. REPEREIGES FOR EACH ADDITIONS SCORE 1 COSERVED RELEASE 0 45 5 1 to observed releases therefore, entire Bate and Lacations oir route is zero. This score reflects guidance tambing Protocols from page 39 and there summed (894 1984). If Lire I is 8, the Se = 8 Enter on Line 5 If Line 1 is 45, then Present to Line 2 2 WETT CHARCTERISTICS 5 2 Chaptest A Secretivity and .123 . . Incomptibility 9 Testeley . 1 2 3 E Hetardous Veste .12345 **Bankity** . 7 . tedlesstive 9 2 5 8 12 14 20MB 1 TOTAL WASTE CHARACTERISTICS SOURS CHENICAL MOIONETIVE 3 TARGETS A. Papulation Within 8 9 12 75 18 4 Mile Rediss **** 9. Distance to Serair 0 1 2 3 tive Environment C. Land Use .123 TOTAL TARGETS SCORE 4 CALGRATION Multiply 1 x 2 x 3 CHEMICAL 9 35100 SYLTHOLOGS 8 35100 5 HORMALIZATION Divide Line 4 by 30100 and Mattiply by 100 CHRFICAL No - 9 00 100 00 MITTE: ME asoro Set Evaluated. NOTOMETIVE to - 0 00 100 00 SUPPLIES CALBRATION OF TOTAL REGISTION SCHOOL CHEMOL MOIMETINE frankater texts 4 10 . (Spr) Auriora Voter Amino 25 25 (Sauch . . Air Bacto 1 10 0.00 (20) ha of Squares 400.27 . Square Root of Ball W. 17. W ••• TOTAL HIGHATION SCORE 43 10 Square Book of Sun Sivided by 1 73

Rocky Flate Plant CRARP Phase 1 DRAFT April 1906

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D044736

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TOTAL RADIT TO

DIRECT CONTACT WORKSHEET

Site: VOC in Grandater

		VALUE		MATE		MAJE	MF	
	EATING FACTOR	Will	VAL	PL I III	scone	<b>SCORE</b>	#C	MEFTREMENT FOR EACH ASSISSED SCIENCE
•	COSESVED INCIDENT If Concrued Incident If Concrued Incident	Is 61van a 1	teers of 45	, Process	to Line	4		Be parametel; therefore, untire source to zone. This score reflects guidance from page S7 HBB Users Manual (SPA 1986)
2	ACCESSISTLET?	0123		1	•	3	• 2	
3	CONTAINMENT	•	15 👊	1	•	15	• 3	
4								
	Chaptest Testelty	4123	•	5	•	15	8.4	
	Endlosstive	0 1 2 4 4 9 12 15	•	1	•	15		
\$.	TARGETS							
	A. Population Within a 1 Mile Bodius	012341	•	4	•	*	8.5	
	S. Sistance to a Critical Mabitat	0123	-	4	•	12		
	TOTAL TANGETS	00000			•	×		
•	SALGRAFICE 17 Line 1 to 45, Rul 17 Line 1 to 8, Rul							
	•		CHEMI	ICAL MET IVE	-	21400		
						3.000		
7	HORMALIZATION							
	Sivide Line 6 by 2148		CHERICA			100 25		usfil: ut come tot freiusted.
			LAD IGACT IV			100 (0		
		,	MARINA		0.30	100 00		

Rocky Flate Plant CEARP Phase 1 DRAFT April 1906

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D044737

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#### FIRE AND ESPLOSION WERE MARKET Sites will in translator

			VALU		#L	MATI		MAR	161	
	CATING FACTOR		<b>LAM</b>		WAL	N.III	80008	scort	*	AFFRENCES FOR EACH ASSIGNED SCORE
	COSEEVED WELLAND	1		3	•	1	•	\$	7.1	to potential; therefore, withre same is zone. This score reflects guidance from page 49 MS Users Manual
2	MARTE CHMACTERISTICS	_			_	•	•		7 2	(EPA 1984).
	A Direct Evidence 9. ignitability	-	3 3		**	i		3		
	C Restivity		11		=	į		i		
	9 Institutionity		;;		-	ì		•		
	E Maste Guartity	• •	••		_	·	·	•		
	Chapterl	9 1 5 4	234 78	•	**	1	•	•		
	Redisantive	• 1	2 <b>3</b> 5	4.		1	•	•		
	TOTAL WASTE O	MAAK	TTE !	rtes (						
				-	H CAL		•	*		
			1	M ION	STIVE		•	*		
3	TARGETS								73	
-	A. Distance to Scarcet Possistion	• 1	234	• •	•	1	•	•		
	s statutes to Heartst	• 1	3 3		•	1	•	3		
	C. Sistemes to tenti- tive Environment	• •	: 3		•	1	•	1		
	D. Land Uto	• 1	2 3		100	1	•	3		
	E Papulacian Vishin 2 Hile Radius	• 1	234	. 5	•	1	•	•		
	P Buildings within 2 Hilo Redius	• 1	234	. 5	•	1	•	•		
	TOTAL TABLETS	1 100	•				•	*		
4	CALGRATIC									
	matiply 1 s 2 s 3									
					Confin		•	1446		
					14010	met i vii	•	1446		
5	HERMAL ! ZAT 160									
-	Bivide Line & by 1648	-	nd ti	ply by	100					
						L sto +	• •	100 10		MPTE: ME means that the fuel labels.
						E 510 *	• •	100 00		
					MIN	# 2fe +	• •	168.66	)	

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# MAZAND BANKING STSTEN/MEDIFIND MAZAND BANKING STSTEN (MES/MARS)

### MET/MARE SUPPLIES COVER SHEET

PERSON(S) IN CHARGE OF SITE: SCE, Surer

Restroit Internetional, Character

Con Res/Marji Hartt, LASS. SATE: April 1986

### MEMBRAL DESCRIPTION OF THE PACILITYS

(for exemples: landfill, surface impairables, pile, centerror; types of hezardous substances; tesetion of the facility; contemination route of major concerns types of information receipt for ratings against action, see.)

Placed in service in 1988 and upgraded in 1976. An impervious clay ring was

edded orwand the existing landfill and holding and sampling structures were added downstraigh. There is a basel clay forestion under the antire tandfill.

This langiful resolved shremetes, solvent, several small stranelys

collibration sources, and attall assumes of organic chapteris.

scones:		CHERT GAL	LIDICALTIVE	MARTINUS.
	<b>10</b> •	35.73	4 📾	3.73
	<b>100 •</b>	25.05	1 41	24 M
	ter •	51.66	8.10	<b>51</b>
	10 *	0.40	0.00	• •
	8fe •	0.00	1.00	4.00
	10.0	0.40	1.00	• •

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Rocky Plate Plant CRARP Phase 1 DRAFT April 1986

PROPERTY, STATISTICS OF STREET

3**9**3. 1 2.45.

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#### CAGABUATER BOUTE WORKSHOET Site: Present Langfill

		VALUE	<b>M</b> L	MATI		MAN	100	1
	SATING FACTOR	CANDE	VAL	PLICE	1000	10000		REFERENCES FOR EACH ADDITION SCORE
1	CONCENSE SELEMBE	45	49	1	45	45	3 1	Tritium and structium absorved in leachate good in
	If Superved Belasse	la Givan a Soare	of 45,	Present	to Line	4		aid 1970s (87818 1988, Interview 1986) This score
	If Charried Release	is Siven e Score	of 0,	Present	I to Line	2		reflects guidance from page 9 823 Users Haruai (EPA 1986)
2	NOUTE CHARACTERISTICS						3 2	
	A Depth to Aguifer of Consens	0123		2	•	•		
	8 Not Prosipitation	0123	44	1	•	3		
	E Personability of the Unsetureted Zano	0123	•	1	•	3		
	1. Physical State	0123	•	1	•	3		
	TOTAL ROUTE C	-	HANG.		•	19		
3	CONTAI INFORM	0123		1		,	3 3	
			_		_	_		
4	WARTE CHARACTERESTICS						3 4	
	Chamical							
	A. Testel ty/Persistens	12 13 1	16 16	1	16	18		Assumed some housy extends temberty 3; persistance 3
	I Recording Vante	. 1 2 3 4 5	1	1	1	•		About 1888 by sanitary source sludge disposed 1946 1979
	Cantity	470						(AFEIS 1980 p 2 200; Own 1975). Curreity 1 to 40 drums. This searing reflects guidance from page 19
	ted costive							HPS Users Reveal (SPA 1986).
	A. Mariana Garanai	01371115	1	1	1	<b>*</b>		436 pSI/1 tritium electroni adjacent to larefill;
		21 26						landfill edress dreinage from well with higher values
	8. Macina Potential	0 1 3 7 11 15 21 26		1	•	*		(87618 1989) Insufficient data for maximus patential.
	TOTAL WASTE CO	-						
		CHERT			19	*		
		LAP IONET	IAE		1	*		
5	TARGETS		_	_		_	3 3	
	A Scoundator Voc	0123	8	3	•	•		Assumed use for drinking unter with elternate source
	8 Sistance to Reseast		12	1	12	4		evolution describe until 1 to 2 at afferent should
	Voi I/Papulation	12 16 18 20						50 rural walls within 3 alleas papulation served
	Served	****						secured at 190 (3 8 people per upl(). This scaring
						48		reflects guidance from pages 36 to 27 MRS Users Herust (SPA 1986).
_	TOTAL TANGETS				-	•		(Gra 1707)
•	If Line 1 is 45, Ref							
	If Line 1 to 0, ma		- •					
		,.,		<b>M</b>	15300	17330		
			EAR IO		216	1730		
7.	HORMALIZATION							
	Olvide Line 6 by 9730	and Materialy in	100					
			MPICAL	100 -	**	<b>140 48</b>		milit: Ill asora tot frotuntes.
		1401	<b>WET IVE</b>	100	1 45	100 66		
			114		* *	100 00		

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# SURFACE WATER SOUTE MONTHEET Site: Present Landfill

					VAI	LUE			_	44.71			MAE	921	•
	BATING	PACTOR			-						100		10000	120	•
		•										•			
1	35 MERVED 1		•				45			1		45	45	4 1	Tritium and struntium absorbed in leaskate pand in
		rved Release !													aid 1970s (BFEIS 1980, Interviews 1984) This searing
	If Otto	rved Beleese i	•	81 v	•	. 4	el us	ef (	),	Proces	d to	Line	1		reflects guidance from page 29 MS there Harnel
	19/1E CM														(BPA 1984).
•		y flago and		• 1				_		•		•		4 2	
		raning Terrein		• •	4	•		_		•		•	3		
	_	the Reinfell		. 1	,	1		-		•		•	3		
		e to Verrest		. 1		-		_		2		ě	-		
	berte	oo Voter			Ī	-		_		_		-	•		
	8 Physics	i State	(	9 1	2	3				1		•	3		
	1	OTAL MONTE COM	•	T	211	mie	90					•	15		
	CONTAC MEN	_		. 1	_	_		_		,		_	1		
•	CONTACTOR	•	•	, 1	•			***		•		•	J	4 3	
4	WATE CHA	ACTER (ST ICE												4.6	
	Chaptest													•••	
	A Testett	y/Pero leteres	• 3		•	12	15 16	, 1	•	1		18	18		Assumed some heavy cartalog tendedty 3; paraletares 3
	1 tearts	waste	• 1	1 2	3	4 5			١	1		1	•		About 1660 by contrary scuape studys disposed 1948 1979
	<b>CLUME</b>	lty :	6 1	7 8											(APRIS 1980 p 2 200; them 1973). Countity 1 to 46
															drums. This souring reflects galaxies from page 19
	Real court ly	•							_			_			und Linera Revent (SPA 1984).
	A Melma		-	-	-	11 1	15		3	1		3	*		1,100 pt//L tricium (ASSE 1900-1906).
			•	*		11 1	_	_		,			*		
	) Aurice		21	_	•	11 1		-		•		•	•		transferent date to evoluate austana MISS score
		,	••	_											
	TW	TAL WASTE CHAR	461		187	100	9000								
								_				19	*		
_					*	DIG	KT IV	•				3	*		
5	TARGETS		_		_	_			_	_		_		4 5	
	A Surface	te Sereitive	-	1	-	-			3	3		•	•		Great Watern Reservoir (material water supply) for Breamfield. So carattive governments in
	Envin		•	•	•	•			•	•		•	•		area (APEIS 1989) Biotores to reservoir 1 to 2 miles;
1	C Page at la		•		<b>4</b> :	8 16		1	•	•	1		4		position served over 10.000. This searche reflects
		n to water	-	_	_	18 1		_	-	•		~			suldants from manua 36 to 30 the thorn terms (CPA
			-	-	-		<b>5</b> 4	)							1961).
		TAL TARGETS OF									1	<b>)</b>	25		
•	CALGRATIC	)													
		1 to 45, mett		•									WEN!		
	If Line	1 to 0, Rett	ipt	y I	i s	3 4						_			
										_	3530	_			
		_						الحد	-	11 <b>16</b>	74				
7.	MINISTER LIE		_	-	4 -	<b>.</b>		100							
	******				10 E	ا بر.			_	•	51 6	<b>2</b> 10			MITE: ME cause not brolunted.
						•	_		_	Stee •	8.1		W.W		
						-					44.6				

		Aie	soutt va	ME SHEET		Sites	Process Landfitt
	RATING FACTOR	CANCE		MATI PLIER	10000	NAJI SCORE	MER. REFERENCES FOR SACH ABSTRACT SCORE
1	OBSERVED RELEASE Bate and Locations Sampling Proteons: If Line 1 is 0, the If Line 1 is 43, The	<b>30 · · ·</b> Enter			•	49	5 1 to abserved release; therefore, antire oir route score fo zero. This score reflects guidance from page 30 MES Unare Harupi (SPA 1986)
2	-						51
	Chast and						
	A Resetivity and Incompetibility	*123	•	1	•	3	
	8. Tenicity C Mesordan Waste	*123	•	3	•	•	
	Questity	412345 478	**	1	•	•	
	Endinastive	0 2 9 0 12	4 20mg	1	•	**	
	TOTAL WASTE CO	MALETER I ST I CI	10000				
		-	<b>C</b> IOL		•	×	
	TARGETS	MOIO	METIVE		•	**	
3					_		
	A Population Vithin  4 Wile Coding	8 9 12 19 14 21 24 27 30	•	1	•	30	
	8 Sistems to Semi- tive Sevironment	0123	•	1	•	•	
	E Land Vine	.152	•	1	•	3	
	TOTAL TARGETS	16300			•	30	
•	CALGRATION						
-	Ruttiply 1 a 2 a 3						
			CHENT		•	35 106	
			-	METIVE	•	35 100	
5	MONTAS I JAMON			-	-		
	Sivido Lino 4 by 3510	out matting	y by 100				
			CHENIC		• •	100 00	MOTE: ME more dat Evolunted
			MOIGHETIN			100 00	
		•••		# to •	• •	100 🗪	
		-		1074, 1	1414714	10000	• • • • • •
						<b>VO (CAST</b> )	
	trountages touto	(Sgns)		•	× ***	1 41	•
	Surface Voter Route	(Seu)			51 M	8.18	
	Air Boon	(\$40)			"		
	No of Squares	1		1	465.76	4.5	
	teary lost of his				56.36	1 30	
					••••	•••	•
101	TAL INTERATION SOURS	(9m)			13.73	4.88	Square floot of the Sivided by 1.73

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#4.

DIRECT CONTACT MORESHEET Sites Present Langfill

	RATING FACTOR	dunds.		MATI PLISS	1CONE	MAX SCORE	M()	
1	OBSERVED (UCIDARY If Observed Insidence If Observed Insidence		of 45,	•		4	4 1	do sheared incident of parametic contemination or injury
1	ACCESSISILITY	0123	1	1	1	3	6.2	Sempley guard, severed landfill
3	CONTAI HINGE/T	0 15	•	1	•	15	6.3	Covered landfill. This every of tore gives a direct compact scare of lare at step of therefore, the rest of
4	WASTE CHARACTERISTICS							the sheet is not essent. This secring reflects entires from same ST to 60 MMS there Reveal (Da.
	Chaptest Textelly	0123		•	•	15	0.4	1981).
	Redisastive	0 1 2 4 4 9 18 19	=	1	•	15		
3	TARRETS							
	A. Population Within a 1 Mile Radius	012345	4	•	•	*	8.5	
	9 Platerus to a Critical Additor	•123 •	◀	4	•	12		
	POTAL TARGETS	******			•	×		
6.	CALGALATION  17 Line 1 is 45, Mai  17 Line 1 is 6, Mai		ı <b>9</b>					
			CHENT	em, Metive	-	21440		
				146	•	51455		
7	Bivide Line 6 by 21400	and Sulffalo Se						
			DICH.	No	• •	100 00	)	MFT: IE more let Evelustes.
		840104	CTIVE	Sale .	0 00	100 00	1	

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## FIRE AND EXPLOSION NUMBERSHEET SITE: Present Landfill

		VALLE	981.	MATE			MF .
	MATTING TACTOR	NAMES:	WAL	M. I ER	score	scane	MEE REFERENCES FOR EACH ASSIGNED SCORE
-	COMERVED RELEASE	1	3 •	•	•	3	7 I so patential; therefore, entire score is zone. This score reflects guidance from page 69 MS Users Manual
•	A. Sirest Evidence	. 3	<b>11</b>	1	_	3	7 2 (874 1984)
	a imitability	0123	-	i	•	3	
	C Reactivity	0123	=	i		3	
	0 (negativity	0123		i		,	
	E Veste Cuntity		-	•	•	•	
	Chaptest	01214 1476	•	1	•	•	
	Redi cost ive	.12356	• •	1	•	•	
	TOTAL WASTE C	CHARACTUR I ST I C	3 100Mg				
			TAD I FEBRUARY		•	20	
		RADI	ONET IVE		•	20	
_							••
3	TARGETS		_		_	5	73
	A Distance to Moreot		=	1	•	•	
	Papulation B Distance to Secrept		-	1		3	
		• • • •	-	•	•	•	
	C Distance to Sarai-	.123	•	1	•	3	
	tive Environment		_	•	•	•	
	D. Lord the	0123	16	1	•	3	
	E Population Vithin	. 12345	•	1	•	5	
	2 Mile Region						
	F Buildings Within	012343		1	•	3	
	2 Mile Rediss						
					_	••	
	TOTAL TARGET	1 100			•	*	
4	CALGRATION						
•	Multiply 1 x 2 x 3						
				M.	•	1446	
			140104	ETIVE	•	1440	
	MERITAL IZATION						
•	Divide Line 4 by 1448	and Rettlety	W 100				
	211/40 \$114 4 49 1444		CHENICAL S	Me -		100 00	MOTE: It was but frolunted.
		•	-	lfe =	• •	100.00	
			-	-	4.40	100.00	

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### HAZAND RANKING SYSTEM/NEDIFIED HAZAND BANKING SYSTEM (HES/HURS)

#### HES/HUNS SUMMET COVER SHEET

SITE MARE: 963 STAR Storage Area

FIBLD OFFICE: Booky Flots Plant

PERSON(S) IN CHARGE OF SITE: POR, Survey

Social interrutteral, tearuter

AND OF MEVIFORE Ear Rea/Mariji Rarts, LAM, 0475: April 1986

#### MANUAL SCHOOLSTICK OF THE PACILITYS

(for examples: Landfill, purface impoundant: pile, container; types of heserdaus existences teserion of the facility; contamination route of major exceemy types of information readed for ratings against extent, etc.)

This area was used to store dram of spent mathins outling oil. The dram were

reserved between 1967 and 1966. Some of the exteriol leaded, and aimse

11 4 El plutanium were released. Of this, about 8 & C1 remained evolto, of

which 1 7 61 are under the existing god (87618 1989, p 2 75).

*******	CHETTERL	MOTERATIVE	
<b>10</b> •	86.05	0.91	26.13
10r ·	<b>*</b>	1 41	* *
tou .	13.27	9.70	17 📂
<b>50 •</b>	3.6	• •	2 4
Sfe •	1.00	0.00	• •
140 -	1.00	• •	• •

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THE THE PARTY OF T

**3** 

		VALUE	- MIL	MATI			
	BATTIME FACTOR	tunes .	. VAL	PL IER	<b>SCORE</b>	-	E SEC. REFERENCES FOR LACE ACCIONES SCORE
,	CRISTING PELEASE	•	15 45	•	45	43	3.1 Plutanius detertos in grandator (ASO 1981) Tris
'	If Channel Seleme !	•					3.1 Plutanium detected in grandator (ABM 1984) This score reflects guidanes from page 9 MS Users Manual
	If Charrest Retains !		-				(SPA 1984).
	***************************************		# W W,	-	(0 C//40	•	(Br. (see).
2	ROUTE CHARACTERISTICS						12
	A Bepth to Aquifer of	0123		2	•	6	
	Corporn						
	8 Not Proxigitation	4152		1	•	8	
	C Personality of the	. 1 2 3	-	1	•	3	
	Undeturated Zana	_				_	
	9 Physical State	• 1 2 3		1	•	3	
	-	MACTER IST IC	10000		•	15	
3	CONTAINMENT	1123		1	•	7	1.3
4	WASTE CHARACTERISTICS						14
	Chaptesi						
	A Touletty/Persistance		9 10 10	1	10	18	Assumed testicity 3, partitioner 3 Assumed 6 98 of
	1. Heartha Well	012345	1		7	4	the draw testeds should 20 draw. This site was
		678	•	•	•	•	cleaned. This searing reflects aridance from seco 17
	Quantity	• / •					and there manual (SPA 1984) and MITTE Creining course
	tediestive			_	_		A 40
	A Maximus Charried	0137111	5	1	•	×	9 19 pE1/1 pturestup for units (ADM 1908) This upo
		21 26		•	•	•	the mighant value shown in the samitaring reports Uncertained of 11 4 61 plustenium (MPSIS 1988).
	8 Hazingo Perential	0137111	7	,	1	*	tions total or 11 4 61 brainings (mails livin).
		21 36					
	TOTAL WATE CO	484678B1 47 1 C	-				
	19175 00016 00				19	*	
		_	METINE		1	*	
	TARGETS				•		11
•	A Transactor Use	. 123	2	3	•	•	Assumed was for drinking water with elternate source
	8 Statumen to Hourset		12	ì	12	40	evolution. Distance to recreet wall 1 to 2 oils
	Vol.1/Provietion	12 16 16 20	_				About 30 moral units within 3 miles; population served
	terest	***	4				essumed on 198 (3.8 people per well). This enering
							reflects gridenes from pages & to 27 MM Users Revusi
	TOTAL TARGETS	1000			18	49	(SPA 1984).
4	CALGALATICE						
	If Line 1 is 45, Rei	tiply 1 = 4 :	<b>.</b> 5				
	If Line 1 is 0, mil	cipty & a 3 :					
			CHEM		15390	97780	
			24019	AST IVE	810	57330	
7	HOUSE TATION						
	Sivies Line 4 by STEE	out Publish					W MITTE AT GRAPE HET Freiherteil.
				. 100	26.04	140.00	
		1	we least IV		1,41	100.00	<del>-</del>
						109.00	<b>=</b>

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**#** 

# SURFACE WATER ROLFE MORESHEET SITES 903 Brum Storage Area

			٧			<b>SEL</b>	44.11		Mair	061	•
	SATIMO FACTOR		•	w	1	VAL	PLIEB	SCORE	scone		
		_									
,	CREENS WILLIAM		<b></b> -		45	45		41		4 1	Plutanius detected in surface votor (ASPR 1982 1984)
	If Cheervad Release						•				This scaring reflects guidance from page 29 mits users
	If Comprise Release	18	-		701.00	<b>•</b> • • • • • • • • • • • • • • • • • •	Presen	to L	~ Z		Market (\$PA 1986).
5										4 2	1
	A Facility Slope and		• 1			-	1	•	3		
	Incorrening forral										
	8 1 yr 24 hr Rainfal		• •	5 2			1	•	3		
	E Sistame to Heartst		• 1	<b>2</b> 3			2	•	•		
	Surface Voter					_		_			
	9 Physical State	1	• 1	13			1	•	3		
	TOTAL BOUTE CO		ette	11871	<b>a x</b>	-		•	15		
3	CONTAINMENT		• 1	2 3			1	•	3	4 3	
•	WATE CHARTERISTIES									• •	
	A Tenicity/Persistense		•		16 1	18	•	18	18		Assumed testifity 5, spreistones 3. Assumed 6 12 of
	S. Separation Wash	_		3 4		• ;	-		7		the dram leabels about \$5 dram. This site was
	Settler	_	7 8	• •	-	•	•		•		cleared. This searing reflects guidance from man 34
		•	•								HRE there Herest (EPA 1984) and HETEL trefning source
	Redfeestive										
	A. Resignati Chaurved	•	1 3	7 11	15	•	1	•	*		0 11 pc1/L plutenhas in Homen Greek (ADD 1704).
			×								
	S. Maxicum Potential	•		7 11	13	1	1	•	**		Assume tested 11 4 El plusantum (RPEIS 1988) Streem
		21	*								is about 1 s 10-9 liters per year (Nurr 1976)
	TOTAL MASTE COA	•	<b></b> 1	STIC	900						
				•				19	*		
			ľ	<b>140</b> 19	OCTIV	a .		1	*		
5	TARGETS									4 5	
	A Surface Voter Voc		1 1				_	•	•		Surface unter within 3 of used for Livesteck
	8 Distance to Samitive	•	, 1	2 3		•	\$	•	•		to complete environments in the eres (AFEIS 1980) Distance to surface water intobe descetted 2 to 3
	Environment C. Pumulation Served'		• •	4 8 '	•		1		40		offers assume production between 1 and 100 pages a
	Pistores to Motor			• 16		•	•	•	_		This is the semand association at risk from welliging
	Intelle Seuratress		-		3 4						the (freetesk (50 cms times ) 5 seeple per cou)
	TOTAL TANGETS				-			10	75		This searing reflects guidance from pages 34 to 36 off
٥.	MLGRATICO		_								Veers Remail (SPA 1986).
	If Line 1 to 46, Md	119	ly 1	. 4	. 5				44300		
	If Line 1 to 0, Rel	tig	ly 2	43		. 5					
							_	<b>1970</b>			
_						wie	RAIA	496			
7.	100704.1267100				<b>.</b>						
	Divide Line 6 by 64300		J   N	4410			-	13 29	100 00		MITTE ALL CAUSE SIX Evaluated.
					-				100.00		
									100.00		

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Recky Flats Plant CEARP Phase 1 DRAFT April 1986

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		AIR BOUT	t va	K MET		81101	95 tra tringo ino
		value-		MALTE		TAX	wt?
	BATING FACTOR	evinet.		PLIM	scene	tests	THE REPERMINES FOR UNEW ASSISTED SCORE
1	CONSTANT SELEVER	• 45	4	-	45	45	3 1 Charried release (87619 1990) This seare reflects
	Date and Leastiens	900 SPEIS 1900,					guidance from page 30 100 tears Harust (EPA 1984)
	Sampling Processi:	300 17618 1986.					
	If Line 1 to 0, the 1			•			
	if Line 1 is 45, The	n Present to Line	2				
2	WASTE CHARACTERISTICS Charless						9.2
	A. Besettilly and Insertablity	4123	1	•	1	3	Notariol present but does not pass a heary (correspondent, p. 40).
	8. Tariolty	.123	3	3	•	•	Assumed temicity 2, persistence 3. Assumed 0 32 of
	C Noserdays Naste	012345	1	1	1		the drum testedy stant 25 drum. This site ups
	<b>Can</b> tity	478					cleaned. This earling reflects guidance from page 44. With Union Martin (894-1986) and HITME training degree.
	Radiosstive	0 2 3 8 12 16 30	•	1	•	**	Air releases 1 is 10-3 erruptly are too small to result in a same (ASS 1906-1906).
	TOTAL WASTE OF	-					
		castle	AL.		11	**	
		MO I CHETT	W		•	20	
3	TABLETS						
	A. Population Within 4 Mile Redige	0 9 12 15 16 21 24 27 39	21	1	21	*	Asputation (variety and the 1 ofto is because 3,001 and 10,000 graphs (ADM 1106).
	8. Distante to Serof- tive Environment	0125	•	2	•	•	No completive environments in area (APEIS 1980).
	C. Land tipe	0123	3		3	3	flotgree to merest industrial area < 0 25 miles
							The searing for targets reflects guidance from pages.
	TOTAL TABOUTS	sound			*	39	44 to 44 MM Hours Markel (BPA 1984).
4	CALGRATICE						
-	Autiply 1 s 2 s 3						
		(	CHEMI (	CAL	11880	35100	
		(	w ie	MITINE	•	35100	
9	MORPHAL I ZAT 1 COM						
	sivide Line 4 by 3514	of the sales	100				
					35 16		HITE: HE appear for Evolupted.
				<b>**</b> • •		100 00	
		-			# =		
	••• • •••	RUPPINY CALBALAT	-		MI GRATICE		• •• • •• ••••• ••••• • • • •
							_
						MO 100671	~
	(resolutor laste	(Squi)			**	1.61	
	furface states facto	(90c)			13.20	0.70	
	Air tone	(00)			<b>1</b>		
	tes of Squares				204.73	2.40	
	Square book of this				4 2	1 38	
				•	•	••••	·
19	TAL RIGHATION SOURCE	(100)			20.13	9.91	Square Best of the Hividad by 1.75

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Bareky Flate Plant CEARP Phase t DRAFT April 1986

TTS 17356

**F**.

BIRECT CONTACT MERCHEET Sites 983 Brus Storage Arms

	AATTUG FACTUR	AANGE AANGE		MALTI PLIM	<b>9CSME</b>	MAX SCORE	ngs. Refrinducts for each appliance scane
1	coopeyes incident If theoryed incident If theoryed incident		of 45,			•	8.1 to asserved incident of paradiret contamination or injury.
5	ACCESSIBILITY	0123	•	1	1	3	8.2 teachty suind; adequate surface cover
3	CONTAINCENT	0 15	•	1	•	15	8.3 Adequate curtain cover. This score of sore gives a
4	WATE CHARGESTICS						direct context scare of sore of oten of therefore, the rege of the chast is not conted. This scoring reflects deletes free scare ST to SF MB Users Mercal (SPA
	Charlest Taxietry	.123	=	5	•	15	8 4 1994).
	tedicest (v)	0 1 2 4 4 9 12 19	•	•	•	15	
,	7ARESTS A. Population Within a	*12345	•	•	•	*	<b>6.5</b>
	8. Distance to a Critical Repitat	*123	4	•	•	12	
	TOTAL TARRETS	10006			•	**	
4.	. Goldstation If Line 1 is 48, Rul If Line 1 is 0, Rul	Attply 2 a 3 a 4 s	CHEM	BAL METIVE		21400 21400	
				<b>5</b> 11 <b>76</b>	•	-	
7	Sivide Line 6 by 21600	8 and Multiply by	100				
		CH( 240104		14 ·		100 00	
				hás •		100.00	

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Booky Fints Plant CEARP Plane 1 DRAPT April 1906

# FIRE AND EXPLOSION WORKSHEET Siter 963 Brus Storage Area

		VALUE	•	101	PATI			ME		
AATING FACTOR			••		PLIME.	900		10000	H!	
1. 22.22.22			•			_			mc.	REFERENCES FOR SACE ASSISSED SCORE
1 CONSERVED MELEAGE	1		3	•	1		•	1	7 1	Sh constate should be a
2 WARTE CHARACTERISTICS									• •	the parameter; therefore entire edere is zero this
A Direct Svidence		_							7.2	score reflects guidance from page 47 m2 thorn Mercel (GPA 1964).
e, ignitability	1	3		-	1		•	3		
E. Restivity					1		•	1		
• incompatibility	012		_	•	1		•	3		
E Marte Guntley	• • •				1	1	•	3		
Chaptes	. 1 2	8.4		_						
	347		•	•	1	•	•	•		
	,	•								
Restauss I vo		354			1					
	•	• • • •	-	•	•	•	•	•		
TOTAL WASTE	CHARLET	<b>#</b> 18716		-						
								_		
		<b>***</b> 1	met tv	•				<b>.</b>		
						•	'	_		
3 TARGETS								,	7 3	
A. Oletaren te seurent Papalatien			4	l	1	•	1	5		
9 Plotarus to Hourset Building	. 1 2	3	-		t	•		1		
C. Sistems to Samel-		1	-		t			_		
tive Swireways		•	_		•	•		1		
Pr Land Upp		1	=		,			_		
E. Population Within	. 12	343	_		ì	:		3 <b>5</b>		
arte tellus			_		•	•		•		
* Buildings Within	.123	845			1	•		3		
E Hile Copius					•	•	,	•		
TOTAL TARGETS	<b>SCHOOL</b>					•				
4 CARATIE										
Autripty 1 x 2 x 3										
				MEM		•	144	-		
			140	i ang 1	146	•	144	•		
5. WHILLIANTED										
Bivide Line 4 by 1648 a	-		-							
				M 44				_		_
			MET!			-	-	<del>-</del>		is a core tot trolusted.
			MIN	-		-	_	=		
						• •	100	-		

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**

#### MAZAND BANKING STOTON/HEDITION HAZAND BANKING STOTEN (HIS/HERS)

MES/MISS SUPPLIES COVER SHEET

SITE HARL - Employeetive Site 800 Arms

FIELD OFFICE: Booky Flots Flant

OPA MACONE VIII

PERSON(8) IN CHARGE OF \$17E1 - DOE, CAPAR

Testingti International, Sparetor

MANE OF REVIEWER: Kan Boo/Mar/I Martin, LAM. BATE: April 1986

#### COMMAN, DESCRIPTION OF THE PACILITY:

(for example: Landfill, surface important, pile, container; types of heardess educations leastles of the facility; contained on real of major contains types of information readed for resing; against section, etc.)

An area east of building 801 was used to dispose of 200 time of plutuning-conceptrated soil.

Cabout 7 dearly eight exclusive from the building 776 fire (100 time from and approximately

68 yet of plutanius-conteminated soil (about 36 days sighe extinity) from the

Building 774 waste storage tank area. This contemination was covered with approximately

3 ft of soil and fill material (them 1979 )

**经**经

SCORES:		CHEMICAL	WO I CASTING	THE TRUE
	<b>**</b>	20.27	1.40	<b>21.2</b>
	<b>190 -</b>	**	1.00	32.30
	ton .	13 29	4.00	13.89
	<b>50</b> •	• •	9.00	1.00
,	8fe <b>4</b>	0.00	• •	1.00
		1.00		0.00

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- 6

Realty Flate Plant CEARP Phase 1 DRAPT April 1906

# GROUNDWATER ROLITE VORCEMENT Site: Regisective Site 600 Area

		VALUE	SEL	MATI		MAX	967	
	RATING FACTOR	-	VAL	PL I ES	SCORE	1COM	100	METERMICES FOR EACH ARRIGINGS SCHOOL
•	-	0 45	45	1	45	45	3 1	Plutanius decested in graundanter (ASR 1984) This
	If Observed telepse	is Siven a Score	of 45,	Process	to Line	4		score reflects guidance from page 9 MRS Users Hersel
	Ef Chaerved telegas	is tiven a secr	of 0,	Proceed	to Line			(BPA 1986).
2	ROUTE CHARACTERISTICS						3 2	
	A Beath to Aquifor of	4153	116	5	•	•		
	Canearn							
	8 Not Procipitation	0123	-	1	•	3		
	C Permodility of the	0122	•	1	•	3		
	Unacturated tene							
	P Physical State	.125		1	•	3		
	TOTAL MOUTE CO	MACTERISTICS (	cost		•	15		
3	CONTAI WHENT	0125	•	1	•	3	3 3	
4	WATE CHARACTERISTICS						3.4	
	Chesteel							
	A facialty/Persistence		16 16	1	18	18		Assumed temisity 5, paralestance 5. Used total quartity
	S Securities Mante	. 1 2 5 4 5	3	1	5	•		of soil buries (300 toro plus 60 yel + 300 toro or yel)
	<b>Guartity</b>	676	•	•		•		This evering reflects galdway from page 19 MM Users Named (SPA 1984) and HITM training course.
	testinentive							
	A Maximum Maserved	01371119	•	1	•	26		8 19 pCf/L plutenius in units (ASSI 1982) This was
		21 26						the highest value cheen in the confeoring reports
	1 Recipe Potential	0 1 3 7 11 15 21 26	•	1	•	**		Uned total of 7 (\$10 5 El plutanium. (\$20 tamp at 3 19 pEl/g = 9 15×10 4 El; d0 tamp at 112 61 pEl/g = 4.15×10 3 pEl/gs.
	total water co	-	****					v. chi a polyp.
	101100 00010 60	CHARL			8	*		
		1401000			-	<u> </u>		
•	TARGETS				•		3 5	
•	A Grantheter Une	. 1 2 3	2	3	•	•		Assumed use for drinking upper with elternate source
	& Sistemes to Sourcet		12	1	12	44		evallable. Sistance to recrupt will 1 to 2 dites
	uni i /Penulation	12 14 16 30	_		_			Name 50 rural mails within 5 miles; population served
	Served	****	1					scaumed at 199 (3 & people per unit). This scaring reflects guidance from pages 36 to 27 MSS Upons Hersal
	TOTAL TABLETS	acted.			18	40		(DA 1986).
6	CALGRATICS	_						
	If Line 1 is 45, mal	tiply 1 = 4 = 5	;					
	If Line 1 to 9, Red	cipty 2 = 3 = 4	15					
	•	•	CHEMIC	**	18430	37330		
			1010	et IVE	•	37330		
7	HORMAL! ZATION							
	Divide Line & by 37290	and Ruttiply b	y 100					
			CHEMICAL	tige *	××	100 00	1	MFG: All cause the frolusted.
		MAR	IONET I'VE		• •	100.00		
			MARING	100	<b>31.34</b>	105.00		

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#### RAPACE WITER BOUTE MORNINGT Site: Solingstive tire and some

			YAL	u <b>e</b>		R	-			<b>361</b> .	*	
	AATING FACTOR		14	-	*	N.	PL198	100		HOURS		•
1	-			. 45		45	,		•			•
	If Minervad Belease	10.00	_			40			49	45	4 1	Plutenius detected in surface unter (ASM 1988 1986)
	If Charved Belease	10 01	<b>707</b>	. vot	- "	0,	Present	t to	Line	:		This searing reflects guidance from page 29 MHS Users Humani (SPA 1986)
\$	MAINTE CHARCTERISTICS										4 2	
	A facility Slape and intervening force		1 2	-	•		•		•	3	•	
	8. 1 yr. 26 hr Beinfel		1 2	3			t		•	3		
	E Pietarus to Hourest Burfass Mater		1 2		•		2		•	•		
	Physical Stone	•		3	-		1		•	,		
	TOTAL MOUTE CA	AGASTI	MIT	rice s						15		
									•	••		
3	CONTAI WHENT	• 1	1 2 1	B	•		1		•	3	4.3	
4	WASTE CHARACTERISTICS										6.6	
	Chesteel										•••	
	A Texisity/Persistense		<b>9</b> 1	3 19 1		18	1	1	•	16		Appetral sections & supersons & succession
	B. Macordous visits	. 1 2	3 4			1	1		ĭ	•		Assumed texts to 3, perstatures 3. Used total quantity of soft terrior (200 torus plus 40 pd = 200 torus or yay.
	Capitity	474	i						•	•	1	This searing reflects guidance from page 36 MB Usero Parasi (876 1981) and MITSE treining source.
	Redisastivo										•	THE REAL PROPERTY.
		# 1 3 # 16		1 15		•	1	1	•	*	•	1.11 pt1/t plunarius in luman breuk (ASPA 1906)
		4 1 3 21 26		1 15		•	1	(	•	*	•	lead total of 7,65:10-3 ET platentia, (300 tare at
												15 pc1/g = 0 13x10-6 c1; d0 turn or 112 at pc1/g =
	TOTAL WASTE CING	<b>ACTUR</b>	ISTE	* ***								12:10 3 pt1/g). Street flee to shoot 1210-7 (from
			(	CHICAL SE	N.			11	, ;	<b>M</b>	•	- 1- 1- 1- 1- 1- 1- 1- 1- 1- 1- 1- 1- 1-
			-	INSTIT	4			•				
5	TARGETS										1.5	
	A Surface Motor Mas	• t					1	4	,	•		urfoso upper within 3 of, upon for (iventest.
•	E. Sistemes to Summistive Sovicement	• 1	2 3		(	•	2	•		•		o caracteria environmenta in the eres (APESE 1985) Interna to seriose vator intelle desertres \$ 10 3
C.	. Population terrod/		• •	10	(		1			•		lies; escured population between 1 and 100 people,
	Distance to Wear Intake Deservings	-	# # # 32	**************************************	•						n	nto to the manufacturation of risk from utilizing to livestesk (30 cmm time 1.5 passes per cou)
	TOTAL TARRETS SE							10	•		79	its exerting reflects puldance from pages 26 to 25 and
6. (	ortheaties of time t to 45, mater	latu 1	- 4					•	•			tore demant (the 1964).
	If Line 1 to 8, mater								•			
		<b>-7</b> 4	- •									
7. WANNALISHTIMS								•				
	Sivide Line 6 by 4480 a	-	tet-	4	160							
									100	-	-	File SE MARIE But Destructed.
				14010		-			100		-	
					MIN				100			
						-	"					

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		A12 40	UTE WOR	ME SMEET		\$1801	Redisective Size 600 Area
							eq
	SATING FACTOR	CAUCE VALUE		ALTI Riss	score	30000	
	SALLING AMELON			74.4-2			
1	Descript Release  Date and Lecerians  Sampling Protecols  If Line 1 to 0, the 1  If Line 1 to 45, Then		Line !	• •	•	45	5 1 to observed oir release from this site. This score of zero gives a zero ecore for the entire oir route. This score reflects guidance from page 39 MMS Usero. Natual (SPA 1984).
	17 CIMO 1 10 43, 100	77,0000					
Z	WASTE CHARACTERISTICS Charlest						51
	A. Constivity and	4123	•	1	•	3	
	9. Testelty	. 1 2 3		,	•	•	
	C Reservicus Vento	012345		1	•	•	
	Quart 1 Ty	678					
	tadiosetive	0 2 3 6 12 16	304	1	•	*	
	TOTAL WASTE CO	-	1000				
		. •	* ***		•	*	
		Melch	Sting		•	*	
3	A. Population Within	0 9 12 15 10	-	1	•	×	
	4 Hile Region 8. Distance to Servi-	21 32 27 39	=	2	•	•	
	tive Statement		_	-			
	C Land Use	0123		1	•	3	
					•	39	
	TOTAL TABLETS	10000			•	••	
4.	CALGRATICS						
-	mulciply t a 2 a 3						
				HICAL	-	35100 35100	
			140	IGACTIVE	•	33 · ·	•
5	Sivide Line 4 by 351		by 10	•			
	314100 Plug 4 07 00			154 to .		100 10	
				41AE #0 -		100 00	
				110.00 %		100 10	**
	• •	237167 CALE			••		
		ereve					
					##		
	transactor taxes	(Squi)			13 29	•	 <b>10</b>
	Surface Veter Bayes	(see) (a2)				0.1	•
	Air texts	· <del></del>			1222.55	•	•
	Sup of Squares Square Book of Sull				35.11	•.	•
						9.	SS Square Stat of San Styldad by 1.75
1	TOTAL HIGHAFTON SOUND	( <b>100</b> )			<b>26.39</b>	₩.	The second secon

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racida /

SINECT CONTACT VERHANDET Site: Redirective Site 800 Area ML MATI MAX BEF MILES FACTOR VAL PLISH SCHOOL SCORE MEE MITTANCES FOR EACH APPEARS SCHOOL 1 CONSERVED INCIDENT 4 45 8.1 to deserved incident of pursuant contemination If Charved Incident is given a Seare of 49, Present to Line 4.
If Charved Incident is Siven a Seare of 8, Present to Line 2. or injury 2 ACCESSIBILITY . 123 1 3 8 2 Security guards adequate surface cover. 3 CONTAINMENT • 1 8 15 8.3 Administrative cover. This storm of pera-gives a direct contest come of zero ot step 6; therefore, the A WASTE COMMACTERISTICS rest of the short to not seared. This searing reflects pricates from pages 37 to 59 the Unors Marcol (874 Chapters Testelly 0123 0 19 0 4 1904). Rest costi vo . . . . . 0 15 9 12 15 S. TARGETS A. Population within a 812343 W 4 1 Mile Sealine 2. Ofsteres to s . 123 4 Critical Mabitat TOTAL TARGETS SOONS 4 CALGRATION If Line 1 to 45, Mulciply 1 s 4 s 5 If Line t is 0, Mattiply 2 x 3 x 4 x 5 CHB11CAL 8 21469 \$401GAETIVE 8 21460 0 21000 CHRISTICAL. 7 HORMALIZATION Divide Line & by 21889 and Suttiply by 100 9 99 199 89 CHEMICAL Sets . HOTE: If more for Evolunted. RADIONATIVE Sale + 0 00 100 00 NATIONAL Sale + 0 00 100 00

**SA** .

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استشر الماسات الماسات

Selection of the second 
#### FIRE AND EXPLOSION MORESHEET Site: Regionstive Site 800 Args

					٧	AL US	1		MIL.	MATI		MAJE	MF
		BATTING PACTOR			•	ANGE	)	,	ANT	PL 188	<b>ACTION</b>	10000	MEE, NEVENENCES FOR EACH ADDIQUED SCORE
1	•	MARINED MELEANS	1				3		•	• •	•	3	7 1 No potential therefore, artire score is zero. This score reflects guidance from page 49 MRS Users Harnel
5		MATE CHANCIER ISTICS											7 2 (0PA 1904),
		Birect Evidence	•		1	-			-	1	•	3	
	•		-		2 :	-		•	-	1	•	1	
		Restivity	-		2 :	-		•	-	1	•	3	
		Investmentality  Useto Guntity	•	•	2 1	J		•		1	•	3	
		Charlest			2 ! 7 (	3 4 8		•	8	1	•		
		Redienctive	•	•	2 :	; 5	• •		•	1	•	•	
		TOTAL WATE C	<b></b>	W	T	1197			_				
								<b>MIC</b>	-		•	**	
						RA.	<b>91</b> %	MET I	W.		•	*	
3	•	ARGETS											73
	•	. Pistures to Bearast Penyletian	•	4	2 1	14	5	•	•	1	•	•	
	•	by lding	•	1	2 :	ı		•	ı	1	•	3	
	•	tive Statement	•	1	2 1	i			•	•	•	3	
	•	Land Use		1	2 3	,		4	•	1	•	3	
	ŧ	. Population Within 2 Mile Radius	•	1	2 1	3 4	5	•		1	•	5	
	•	Pulldings Within 2 Mile Redius	•	1	8 3	3 4	5	•	•	1	•	,	
		TOTAL TANGETS	) H								•	*	
4	c	ALGRAFICE											
		multiply 1 a 2 a 3											
								_			•	1446	
								•	<b>M</b> fC	KIIW	•	1448	
9		ISSPAL I SATTON											
•		91vide Line 4 by 1440		1 #		t feet	y m	, 16	•				
				_ ^			-			\$fe •	• •	100 00	8 mills 16 many but Evoluntation
							140	eac'	rive	100 -	•	144 46	•
								MAR		\$fe =	• =	140 60	•

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Rendry Flats Plant CEARP Phase 1 DRAFT April 1906

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1h

#### MAZARO BANKING SYSTEM/NEDIFIED WAZARO BANKING SYSTEM (NEW/NESS)

HES/HORS SURVEY COVER SHEET

SITE WHEEL Transfes T T to T 11

FIRE OFFICE: Rocky Flots Plant

DA MOIGH: VIII

PERSON(S) IN COUNCE OF SITE: DOS, Burer

Reshall Internetional, decretor

MANE OF REVIEWED: Ean Gog/Mar/S Marts, LAN. BATE: April 1986

#### SENSONAL DESCRIPTION OF THE PACILITYS

(for example: Landfill, surface imparature, pile, container; types of heserone substances location of the facility; rentableption route of sujer concern; types of information recting squary satish, etc.)

#### Covered Transhes.

- T 1 125 drums depleted ununfum plus techo content.

  T 2 Flattered drums plus conflary somme studge

  T 3 Flattered drums plus conflary somme studge
- T & thry T 11 Flattured druce plus century course studge.

		CHEMICAL	uniquet ive	
1000001		*** ****	• • • • • • • • • • • • • • • • • • • •	•• ••
	•	17.15	3 7Z	17 15
	<b>19:</b> •	20 67	7 80	27.67
	Tax •	1.00	1.00	0.00
	<b>to •</b>	0.00	0.00	•.••
	9fo •	9.00	1.00	6.00
	** *		0.00	9.00

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m m dakne bladenmann<del>dende</del>

#### SAGUNDWATER ROUTE WORKSHEET Situs Transhee

		WALLE	-	MATI		MAT	-	•
	RATING FACTOR	RANGE		PLIM	1000	10000	100	
t	COOLEAND SELENTE	a 45	49	1	45	45	3 1	vec detected in groundwater; unsubitation data 1985
	If theoryst delegge !	a fiven a tear	of 45.	Preced	te Line	4		(PC 1988b). This score reflects guidance from page
	If Charved belease I	e tiven e seer	of 0,	Present	to Line	2		9 MRE Users Market (SPA 1986)
5	-						3 2	1
	A Depth to Aquifer of Consorn			2	•	•		
	8 Not Presipitation			1	•	3		
	C Perusability of the	.123		1	•	3		
	Unceturoted Zero  D Physical State	0123	-	1	•	3		
	TOTAL MENTE CH	MAACTER1871C8	cone		•	15		
						_		
3	CONTAINMENT	.123	•	١	•	3	33	
4.	WASTE CHARACTERISTICS						3 4	
	Chapteck							
	A. Textelty/Persistence		16 18	1	10	18		Samps tivings with heavy autolog tenicity 3;
	8. Reserving Vages	. 1 2 3 4 5	3	1	3			persistance 5 (ten) Assumed 1989 drame total.
	<b>Quantity</b>	678						This searing reflects guidance from page 19 HES there. Hereal (SPA 1986).
	tediesetive		_		_			
	A Maximus Channel	0 1 3 7 11 15	7	1	7	×		156 pS1/L uranha in wall (RPELS 1980).
		21 26		•	•	*		Insufficient date to colouiste statem meterial met
	5 Maxistan Potantial	21 26	•	'	•	-		seere.
	TOTAL WASTE CH	MAACTER (STICS	CORE					
		CHE	ICAL		21	*		
		RAD COM	T114		7	*		
5	TARRETS						3 5	
	A Broundencer Upo	.123	-	3	•	•		Assumed use for drinking uster with elternate source
	I distance to bearest		18	1	12	4		aveilable. Distance to nearest well 1 to 2 miles
	Vol I/Papalacian	12 16 10 20						About 36 rural salis within 3 siles; papulation served seaumed at 190 (3 8 people per upil). This searing
	Served	***	•					reflects guidance from pages 26 to 27 MB More Maruel
	****				18	40		COM 1984).
	TOTAL TARGETS							
٠,	If Line 1 is 45. Ref.	state t = 4 = 9	,					
	If Line 1 to 0, mak							
			CHRIST	CAL.	17010	57330		
			MOIO		3470	57330		
7.	HENVALIZATION							
	bivido Line 6 by 57330	and Ruttleby I						
			CHEMICAL		29.47	160.00		MITE: III many tot Svolusted.
		***	PITAME			167.60		
			M IN		<b>5.4</b>	100.00		

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### SURFACE WATER MOUTE WORKSHEET SITES Transhee

	GATING FACTOR		-	LUI Midi	-	-	-	MLTI PLIM	1000	•	142. 1600		SEFFERENCES FOR EACH ARRIGINGS SCORE
1		•			45		•	•		•	45	4 1	to abserved release. This store reflects guidance
	If Charved Selesse !												from page 29 MM Georg Remot (GPA 1964)
	If theoryal telease f		i ve		Astra	•	∙,	Proces	) to	(100	2		
,	MOUTE CHARACTERISTICS											4 2	1
•	A facility Steps and		1	2 3			z	1		2	3		Facility stape 3 to 9%; intervening terrain +8%.
	Intervening Terrein	, `											
	0 1 yr 24 hr Spinfoll	•	1 1	2 3			•	1		1	3		26 he reinfelt 1 \$ in. (Fig. 6, ARCFR300 App. A)
	C Distance to Mearest		1	2 3			ı	1		4	•		Water Great is >1000 ft may This searing raftests
	Surface Veter												guidance from supp 32 100 Veers Ranack (SPA 1994)
	9 Physical State	•	1	3 3			3	1		1	1		Sanitary samps studen (Comm 1973). Used tiquid.
	TOTAL BOUTE CM	446	1	1 <b>8</b> 7	1 <b>CE</b> #					10	15		1
		_						1			•		fremules have adequate severy correstraint pand on
3	CONTAI WORT	•	1	2 3			•	•		•	,	•••	Venue Creek. This seems of sero gives a surface vector
	MATE CHAMETERISTIES				•								reacts scare of ture at step &; therefore, the rest of
•	Chapter												this sheet is not secred. This score reflects guidants
	A. Telicity/Persistence	• 3	6	9 1	2 15			1		•	18		from page 34 MM users Harani (874 1984).
			1					1		•	•		
		4 7											
	tedicestive		_			_		_			••		
	A Maximum Cheerysti	-	•	7 1	1 15			1		•	×		
		21	_		1 13	_		•			•		
	1 Nations Potential	21		7 1	1 13	-		•		•	-		
		•	_										
	TOTAL WASTE COM	MET		<b>9</b> † (	<b>a x</b>								
					CHEMI	CAL				•	*		
				w	ICACT	ING				•	*		
5	TARGETS							_		_	_	4 5	
	A Buriose Water Use		1			**		3		•	•		
	8 Sistemes to Sensitive	• •	, 1	2 1	ı			3		•	•		
	Environment					•		1		•	44		
	C Population Served/		•		) 10 10 20	-		•		•	~		
	pistance to voter			-	:5	44							
	Intake Couratross retal Indetts		= '			_				•	22		
	. CMGAATICE		-							-			
•	If Line 1 is 45, Mel	tia	4w 1		4 = 1	1					44300		
	If Line 1 is 0, Ret	tie	47	1 .	114								
	., , ,	-			'			<b></b>		•			
DVITAMENA							10	MITIVE		•			
7	HORNAL I 247 (40)												
	Divido Line & by 64350 and Mattiply by 160							_	_	100.00		Will: Ill mare let frelutes.	
					•		_		•	-	100 00		many of many or street,
					100	1005	1	100 *	•	=			

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Restly Flats Plant CEARP Phase 1 DRAFT April 1986

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		ATE	ROUTE VOR	K SHEET		Siter	Transles
		VALUE	<b>u</b>	<b>341</b> 1		146	m/
	RATING FACTOR	-		PL 188	score	scond	-
•	OBSERVE MELEARS Date and Location: Sampling Proteoni: If Line 1 is 0, the If Line 1 is 45, The		on Line S	• •	•	43	5 1 No abserved release; therefore, entire air route seere is sere. This essere reflects guidance from page 39 688 Usere Hurset (SPA 1966).
2	WASTE CHARACTER (STIGS Charles)						9.2
	A Sentivity and	• 1 2 3	•	1	•	3	
	8 feelety	0123	-	3	•	•	
	f Recording Veste Quantity	412345 474	•	1	•	•	
	Redisantive	0 2 5 0 12 16	20mg	1	•	**	
	TOTAL WATE O	MAAKTERISTICE	1004				
			DI CAL		•	*	
	******	140 (14)	KTIVE		•	*	
3	TARGETS A Population Within	6 9 12 15 16	-	1		10	
	4 Hite Region	21 24 27 39	-	•	•	-	
	8. Distance to Saral- tive Savirorment	.125	•	2	•	•	
	C. Land Use	0123	-	1	•	3	
	TOTAL TARGETS	*COME			•	*	
4	CALGRATION NULTIPLY 1 = 2 = 3						
	• •		CHEMI C		•	35 100	
			Miles	LET IVE	•	35100	
3	MONNALISATION	<b></b>					
	Divido Line 4 by 3516					105 66	MFT: II mare for frequency.
			MI IOLETIN			100 00	
			MEIN		0.00	109.00	
	••	EJONET CALE	LATICE C				····· · · · · · · · · · · · · · · · ·
				c	HENCAL I	voi meti	THE
							•••
	trandator facto	(Spr)			27 67	1	
	turfees Veter Boule	(Tou)			1 #	- 12	
	Air feuts	(tha)			<b></b>	77.81	
	tus of tipares tours feet of tus				27 67	* **	
							•••
10	TAL HIGHATION SCORE	( <b>***</b> )			17.15	5.72	Square fact of Sun Blvidded by 1 73

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Recky Fiste Plant CEARP Phase 1 DRAFT April 1906

	DIRECT CONTACT WOMES				ME?	Site: Tre		Trenches		
	RATING FACTOR	WALUE WALUE	VAL	MATI PLIM	scont	NAX SCORE	H! HC	REFERENCES FOR CACH ASSISSED SCORE		
1	congress successor of Conserved transfers of Conserved Insident	0 45 to Etvan a Scare	e 49		e to Line		•	to abserved incident of personnel contemination or injury		
5	ACCESSIBILITY	4123	1	1	1	3	• 5	Senurity guard, severed transfer		
-	CONTATIONNET WANTE CHARACTERISTICS	•	15	1	15	15		Covered transles. This seems of term gives a direct express seems of some of step by thorsfore, the rost of this sheet is not seemed. This scene reflects guidance		
	Chapter Tabletty	*123	•	5	•	15		from pages ST to 48 MMS Uport Maruel (8PA 1984).		
	Resissative	0 1 2 4 6 9 12 19	**	1	•	15				
5	TARRETS A Population within a 1 Mile Region	412345	***	4	•	<b>30</b>	• •			
	8. Distance to a Critical Mabitat	*123		•	•	•				
	TOTAL TARGETS	10000			•	×				
•	CALGREATION  If Line 1 is 45, No.  If Line 1 is 0. No.									
	(7 Cine 1 16 9, ~		CHIEF	ICAL MET I VE	:	21460 21460				
7	HORMALIZATION Divide Line 4 by 2140									
		-		Marie e		140 8		uste: It many bet Evolunted.		

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#### FIRE AND EXPLORIGH CONTINUEST Sites Transfer

		VA	NLUE	MFL.	MATI		MAX	w
	RATING FACTOR	W	MOS	YAL	PL 168	SCORE	<b>SCORE</b>	SEC REFERENCES FOR SACH ASSIGNED SCORE
	CREATE MILEARE	1	3	•	1	•	3	7 1 mg parametet: therefore entire score is sore. This score reflects guidance from page 49 MMS Users Manual. 7 2 (SPA 1986)
1	WASTE CHARACTERISTICS	• :		_	,	•	3	
	A Direct Evidence		-	*	ij		;	
	0 ignitability	012		=	i		i	
	¢ feastivity	612	-	-	ì		i	
	• Incorporability	• • •	•	-	•	•	•	
	E Vosto Bunnity							
	Chastasi	412 567	-	•	•	•	•	
	tediestive	• 1 2	3 5 6 8		1	•	•	
	TOTAL WASTE C	MARACTE		COME				
				ICAL		•	*	
			1401046	TIVE		•	*	
								••
3	TARGETS				_		5	73
	A Distance to Bearest Population	• 1 2	345	•	1	•	-	
	6. Distance to Searcet Building	• 1 2	3	•	1	•	1	
	C Distance to Seroi-	• 1 2	3	***	1	•	3	
	D Land Use	. 12	3		1	•	3	
	E. Population Vithin 2 Mile Emilia	. 1 2	3 4 5	-	•	•	5	
	F Buildings Within 2 Mile Redius	• 1 5	3 4 5	•	١	•	3	
	TOTAL TANGET	scome				•	*	
	CALGRAFICE							
•	mitiply 1 x 2 x 3							
				CHE		•	1440	
				<b>**</b>	METIVE	•	1440	1
5	HOMMA IZATION	-4 **	4 <b>0.8</b> m <b>4 4</b>					
	sivide Line 4 by 1448	-	**************************************		. sto •		100 0	an mile: Il coore fot Evolusted.
			-		1 1/0 "		100 0	
					n sfe -		100 (	
				~~.~				

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Rocky Flats Plant CEARP Phase 1 DRAFT April 1986

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- THE STANK TO SEE THE STANK TO SEE THE SECOND SECO

ME.

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# MAZANS BANKING SYSTEM/PEDIFIED HAZANG BANKING SYSTEM (RES/RORS)

		Property Challet Suides		
SITE WE: Sear	tive Matel Beatrustian Site			
FIELD OFFICE: Books	y flots Plant			
DA MOSIGNI VIII				
PERSON(S) (# CHANGE	OF SITE: Plant Ranagar			
	lea/Norji Hartz, LAKL BATE		• •• •	
	M FACILITY: ourface impoundment, pile, on jor concerns types of informa-			the facility
This area was used from t	1956 to 1976 for the destruction	on of 460 to 500 penets		
of lithius extel, small (		 Ptolo (anthum, coloium,	• ••• •• ••	
			** *** *** **	•
••••	• • • • • • • • • • • • • • • • • • • •		•• •• •• ••••••••	•••
	untellers were not dispused, by		• •••••••	
rouse. The press used us	ere assumed to have been on the	•		••
grand surface reduce the				
	CHEFTON, NO HONETING	ALCOHOL:		
		••••		

teimes:	CHEMICAL	<b>WO IGASTIVE</b>	MARIE PROPERTY.
<b>10 •</b>	15.50	1.00	19 52
tqu •	25.06	• •	<b>35.86</b>
San 4	1 10	• •	• •
10 *	1.00	1 10	• #
tfe •	0.00	0.00	0.60
140 •	0.00	• •	• •

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Rocky Flate Plant CRARP Phase 1 DRAFT April 1986

#### CHICLESPANTER POLITE WERESHEET Site: Exactive Metal Bestmetien Site

		VALUE	W.L	MA.TI				•
	RATTUS FACTOR	TAHEE	VAL	PLIM	scong	Icong	***	
	CESSERVED STELEAGE							•
'		45			45	45	3 1	1 VOC detected in grandwiter; washished data 1995
	If Observed Release 1	is siven a seer	• • 67,	Present	to Line	•		This score reflects guidance from page 9 MES Users
	If Observed Belease i	18 El van e 300r	• •• •,	Prophet	te Line	3		Martine (SPA 1984).
2	ROUTE CHARACTERISTICS						3 2	•
	A Septh to Aquifer of	0123		2	•	•	•	
	Carparn			•	•	•		
	8 Not Presipitation	. 1 2 3	-	1	•	3		
	C. Permeditity of the	. 1 2 3		1	i	š		
	Unasturated Lane				•	•		
	Physical State	0123		1	•	1		
	TOTAL MANTE CH	WAACTERISTICS	icing		•	15		
3	CONTACHEMENT	.121	=	•	•	•	11	
		• • • •	-	•	•	•	••	
4	WASTE CHARACTERISTICS						3 4	
		•					•	
	Chasteel							
	A Testel ty/Pereletenes	0 3 6 9 12 15	18 18	•	18	18		Assumed persistent erganic chaptests and tithius
	S. Hosardhup Veste	. 1 2 3 4 5	1	1	1	•		continuous tenicity of \$1 persistence of \$ (560)
	Quantity	678						Total less than I ten (Green 1973). This score
								reflects guidance from page 19 Mts Uppre Harant
	Redissative							(SPA 1986).
	A Recision George	8 1 3 7 11 15		1	•	*		
		21 26						
	8 Maximum Potantial	0 1 3 7 11 13	=	T	•	26		
		21 26						
	******							
	TOTAL MASTE CR	MACTED STICE 1						
			HCAL		19	*		
	TARGETS	MOION	7176		•	*		
,	A Groundmeter Use	0123		3		_	3 3	
	5 Distance to Sourcest		12	-	12	4		Assumed use for drinking voter with elternate source
	Voll/Penviotien	12 14 10 20	16	•	18	•		evoltable Sisteres to reserve well 1 to 2 miles
	Served	***						About 90 rural solle within 3 oiles; population served
			,					escured at 190 (3 8 people per well). This scoring reflects guidance from pages 24 to 27 MMS Upper Natural
	TOTAL TABLETS	acata			18	40		(SP4 1984)
•	CALGLATICE					•		(graines)
•	If Line 1 to 45, that	eletu 1 a A a 9						
	If Line 1 to 0, Red							
				M.	15390	17330		
			B40 10A	_		17330		
7	HORMAL I ZAT 1980				-			
	Divide Line 6 by 57300	and Muttiply b	y 100					
				tgu •	* *	100.00	!	MITTE IN cours but frotunted.
		t/e	INSTINE	100 4		100 00		
			-	100	* *	100.00		

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7 THE TO THE TO THE

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₩,

#### REFACE WATER OBJE WERESHEET Site: Coastive Retail Destruction site

				W	N.UE		<b>M</b> L	MAT	•	MAX	001
	SATING FACTOR			•	wee	•	ANT	<b>PL 10</b>	10000	9000	S SEC. REFFRENCES FOR EACH APPLICATE SCORE
1	CORRESPOND BOLLEAGE	•				45		, ,		• 45	4 1 to abserved release. This seems reflects guidance
	If Charrys telease	10	61	~	• • •	retue	-	, Pro	10 t	ine 4	From page 29 MM Hears Maruel (SPA 1984).
	If Macros Science	10	811	•	• • •	ret van	<b>of</b> 0,	, Pres	HODE TO L	ino 2	
\$	MOUTE CHARACTERISTICS										42
	A facility Slape and intervening terrs		• 1		3		1	) 1	;	, ,	facility class will incorvaning correin will.
	0. 1 yr 36 br. Belnfei		• 1				1			, ,	
	C. Distance to Macrast		•				ì				26 hr reinfett f 2 fn. (Fig. 8, 48CFR388 App. 4) Waten Creek is >1888 ft. map.
	Aufface West				-			•		•	******* (*****************************
	D. Physical State		• 1	2	3		1	1	1	3	Assumed comp Efgeld.
	197AL 3047E C	•	<b>e</b> Ta	<b>m</b> t	<b>3</b> 710	8 990			11	15	
3	CONTAINMENT		• 1		3			•		3	4 3 Covered play conspirators pand on Manus Creats. This
								-		•	score of stee gives a surface route score of sore of
•	UNITE CHARACTERISTICS										4 4 area of therefore, the rest of this thest is not
	Chaptest A Textelly/Persistence		• •				_		_		secret. This cours reflects guidance from page 34 mg
	8 Honordone where		-		4 5			1		19	Voors Harack (SPA 1956).
	Sent 17		7		••		-	•	•	•	
	2adleastive										
	A. Resides Courses	•	1 3	7	11	15		1	•	*	
		21	×	t							
	S. Racima Potential		_		11 1	15		1	•	*	
		21	¥								
	TOTAL WATE CIN	146		181	i es	1000					
						TI CA	-		•	*	
	TARGETS			u	o lo	STIV	•		•	*	
,	A Suffess Voter Use		• •								4.5
	S. Distance to Samultive		-	-	-			3	:	X	
	Environment		•	•	•		-	•	•	•	
•	Femiliation Served/ Sistemes to Motor			-	. 1			1	•	40	
	Intake Secretress		_	_	16 2						
	TOTAL TARGETS	_	•	_		-			•	=	
•	CALGALATION		-						•		
	If Line 1 to 45, Nuti		•			-				<b>M300</b>	
	if Line 1 to 0, Main	t ipi	y i	1 =	3 4		-				
								_	•		
,	WOMPAL LEAFTING					•		114	•		
•	Sivide Line 6 by 64250			4.	<del>(21</del> -	_	-				
		-4	-		-	-•		-	1.00	100.00	Wife: 15 mars for frequency.
						<b>1010</b>	<b>GT ! YE</b>	•		100.00	

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Realty Plate Plant CEARP Phase 1 DRAFT April 1906

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-WESTER - - AND AND - MI COMME

***** ?

4

		AIR #	CLITE VOR	K SHEET		Sites	Reactive Metal Destruction Site
		VALUE	•	MATI		MI	agr
	RATING FACTOR	RAM <b>GE</b>		PL 188	score	scome	
•	OSSENGE RELEASE Sets and Losetian; Sampling Process; If Line 1 is 0, the 1 If Line 1 is 45, the		n Line S	1	•	45	5 1 to observed oir retreser therefore, entire air route score is zero. This assers reflects guidence from page 37 MRS Veero Renuck (SPR 1706);
2	WATE CHARGESTICS Chargest						5 2
	A. Reactivity and Incompatibility	0123	•	1	•	3	
	8 Toxicity	0123	•	3	•	•	
	C. Regarding Veste Bushtilly	612345	***	1	•	•	
	Redirective	0 2 5 8 12 16	2000	1	•	*	
	TOTAL WASTE CO	MAACTERISTICS	TOTAL .				
			MICAL		•	20	
	TARGETS	140 (04	CTIVE		•	*	
•	A. Perutation Vishin	8 9 12 19 16	•	•	•	39	
	4 Mile Bedive	21 24 27 30	_			•-	
	9. Distance to toral- tive Swiresant	• 1 2 3	•	2	•	•	
	C. Land time	0123	=	1	•	3	
	TOTAL TANGETS	10000			•	*	
4	CALGRATION						
	Multiply 1 s 2 s 3		<u> </u>		_		
				ETIVE	•	35 100 35 100	
5	HURMAL I ZATTON				•		
	Divide Line 4 by 3510	M and Makeiphy					
			9 1484) 1 1724) 64			100 00	MITE: 45 maps for Evolupted.
		•		# h ·		100 00	
			••••				
		RAPINET CALCU	LATION (I	P TOTAL I	M CLATIC		
				•	merica.	<b>NA) 1986</b> 71	THE
	transacer basto	(Sgu)			<b>M.M</b>		
	Surface Motor Boute	(Bau)			• •	• •	
	Air Reste	(Ba)			1 10	• •	
	ten of teneror tenero test of ten				700 44	1.40	
N	PTAL REGIATION SOME	(Sine)			15 12	• •	Square feet of the Sivided by 1 75

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Beeky Flats Plant CEARP Phase 1 DRAFT April 1906

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1

DIMET CONTACT MERCENEET Site: Reactive Metal Sestruction Site MAK, REF MEL MAIT VALUE REPTRINCES FOR SACH ASSISSED SOURCE WAL PLIES SCORE SCENE SEC BATTING FACTOR 8 45 8 1 to absented incident of parastral contamination . 1 45 1 CESERVES ENCIDENT If Cheerval Insident is Siven a Sears of 45, Present to Line 4 If Cheerval Insident is Siven a Sears of 8, Present to Line 2 er injury. 1 3 & 2 Security purest adoquate surface sever 4123 Z ACCESSIBILITY 8 15 8 3 Administra current course. This score of core gives a . 1 direct curtast esero of sure of uses 6; therefore, the 3 CONTAINMENT reset of this page is not stored. This score reficets guidance from pages 57 to 48 MS Moore Revuel (EPA & WATE CHARACTERISTICS 4 15 6.4 1994) 2319 Chamical Taxielty **1** . 1244 tediesstive 9 12 15 S TARGETS A. Population Within a 8 1 2 3 4 5 18 4 . . . 1 mile seelis 0123 8, Bistance 10 0 Critical Subitat TOTAL TARGETS SCORE & CALGRATICS If Line 1 to 45, Mutatoly 1 x 4 x 5 If Line 1 to 8, muttiply 2 x 5 x 6 x 9 CHRICAL EVITENDI OLE 7 HOSPIALIZATION Bivide Line 6 by 21600 and Ruttiply by 100 MITTE AL ANGUE AND EVOLUTION. 9 60 100 00 CHRICAL NO. 100 100 00 MINETINE NE . 9 20 100.00 -

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Ready Flate Plant CEARP Phase 1 DRAFT April 1986

The state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the s

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# FIRE AND EXPLOSION VORCEMENT Sites Popertive Metal Destruction Site

	VAI	LUI	•	MATI		MAI	MI	
BATTUR FACTOR				PLICE	econe	10076		ACPUMENCES FOR SACE ASSIGNED SCORE
I CHIEFYID RELEASE	1	3	•	1	•	3	-	tentiet, charafore entire score to zero. This reflects guidance from page 49 MRS years manual
2 WATE CHARCTERISTICS							7 Z (194	1986)
A Birest Svidence	• 3			1	•	3		
8. Ignitability	. 1 5 2			1	•	3		
C Reactivity	. 1 5 2		***	1	•	3		
0 Insuratibility			4	1	•	3		
2 Weste Quantity								
Charrient	. 1 2 3		•	1	•			
Cuim est	3 4 7 8		_	•	•	•		
		•						
tadleastive	. 1 2 3	3 6 6	-	1	•			
			_					
TOTAL WATE C	MARACTER		CHAR					
		CHEN	ICAL		•	*		
		TAR I GAL	TIVE		•	*		
3. TARGETS			_				7 3	
A Bistance to Searcet	. 1 2 3	145		1	•	•		
Papel at lan			•	1	•	3		
S. Biotarao to tearest		•	-	•	•	•		
Building	. 1 2 1			1		3		
C. Distance to Sensi- tive Savinerment	• 1 • 1	•	_	•	•	•		
0. Land the	. 121	R .	•	1	•	3		
E Population Within	. 1 2 1	_	-	1	•	5		
2 Hite Bedies	• • • •		-	•	-			
f. Buildings within	. 12	3 4 5		1	•	5		
2 site sadius								
TOTAL TARGET	100M				•	*		
4 CALGRATION								
Multiply 1 = 2 = 3			0			1448		
				METIVE		1448		
					•			
5								
Bivide Line 4 by 1448	-	tiply by	100					
		a		4 efe •	•	100 (4		at seems tot trolustal.
				f tfo ·		100 0	-	
				# 9fe e		100.00	•	

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#### MAZAND BANKING STSTEN/MEDIFICE MAZAND BANKING SYSTEM (HDS/MHES)

SITE MANE: Griginal Landfill

FIELD OFFICE: Booky Flots Plant

PORSON(8) IN CHARGE OF SITES - BOD, CAPAR

MANE OF REVIEWER: Ean Rosyllar || Marte, LAML SATE: April 1986

### STANDAL DESCRIPTION OF THE PACILITYS

(for example: landfill, surface imparament, pile, centainer; types of heterdade substances; leasties of the facility; concessivation route of sajer concerns types of information received for retirest agency extlen, etc.)

Classed landfill; used from 1952 to 1966. Assumed to contain small

quantities of chamicals. These to contain about 14 people of deploted uranius.

Estimated volume 2 mitties ou ft - Unified but adequately severed.

**are**, 6

900R@94		CHETTERL	WO TOACTIVE	METRIAL PROPERTY.
	••	19.05	4.57	15.65
	700 °	₩.00	7.91	<b>w</b> ••
	tev •	0.00		• •
	*	1.00		•.₩
	8fe =	0.00	• •	0.00
	•••			

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Booky Flate Plant CEARP Place 1 DRAFT April 1966

400

		YALU	MI.	MATI	1	-	<b>107</b>
	SATING FACTOR	RANGE	VAL	PLIM	score	SCORE	MEC. MEPERBUCES FOR SACH ASSISTAND SCHOOL
1	CESERVED MELEAGE	•	45	<b>6</b> 1		44	<b>4.1</b> 1.1
	If Congress Release		zoro of 43	. Press	<b></b>	- 4 "	3 t to abserved release. This score reftacts guidance
	If Chaervad Belease	10 81 van 0 5	sero of 0,	Prese	es to Lin		free page 9 all Upper Hurani (EPA 1984).
2							12
	A Septh to Aquifor of	0123		3 2	4	•	Builth to shellow squifer 10-20 ft , veries accountly
	Corporn				-	•	(Ber 1976)
	8 Not Prosipitation		(	1	•	3	Presipitation 16 In. (Fig. 3, 485FR300 App. A);
	C. Permanellity of the			1	3	3	Late Evaporation 42 In. (Fig. 4, 482F8388 App. 43.
	theoreted Zane						Highly permate (ther 1976)
	8 Physical State	0123	1	1	1	3	Asked well senits of light preside shariests
	TOTAL ROUTE C	MAACTER LET IC	# 100mg		12	19	This searing reflects quidance from pages 9 to 16 mgs.
_					•	.,	
3	CONTAINMENT	.123	1	1	3	3	3 3 Closed Langfill, no Liner
4.	. WASTE CHARACTERISTICS						34
	Chapteol						
	A Testel ty/Persistere		15 16 18				
	F Reserving Waste	012343			18	10	Assumed some purpletent organise and heavy metales
	Auntity	478	•	•	,	•	tenicity of 3; percistance of 3 (Sen).
		•••					Assumed contemporate values to 8 3% of total 2 million
	tediasetive						made fact, or 270 made yards. This searing reflects
	A Residue Cherred	013711	15 7	1	,	•	guidance free man 17 MRS Moore Humani (CPA 1986)
		21 26	,	•	,	*	156 #1/6 trailed (87818 1988)
	S Harings Potential	013711		•		*	44
		21 26		•	•	-	44 pounds deploted unanium in landfill
	TOTAL WASTE CH	WAACTER ( ST I C	SCOME				
			<b>CAL</b>		8	24	
		<b>140</b> (c	METIVE		7	*	
,	TARGETS		_			;	3.5
	A Sreundapter Upo	4183	1	3	•	•	Assumed use for drinking upper with alternate source
	8 Pistance to Hourset		18	1	12	44	evellable Distance to reserve well 1 to 2 oiles
	Well/Papulation Served	12 16 16 20					Mout 16 most valle within 5 alless population served
	301 705	***	₩				escuted at 190 (3 8 people per vott) This seering
	TOTAL TARGETS :						reflects pridate from pages 36 to 27 MM Users Revuel
4.	CALGRATICS				10	•	(SPA 1986).
	If Line 1 to 46, mat		•				
	If Line t is 0, mut						
		,,	CHEMIC		14894	97330	
			200100			57330	
7.	MATTER I ZATION			•	~~		
-	Sivide Line 6 by 57380	and Buttleto	by 100				
			CHEMOL	<b>.</b>	24.80	100 00	MINE A case for frequency.
		•	DIENTINE	-		140 60	
		_	Maine				

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# SURFACE WATER SQUITE WERKSHEET Site: Original Langfill

		ANTIE		MATI		MAN	200	
	RATING FACTOR	we			scent	score		NEFERINGES FOR GACH ABELIEVED SCORE
,	COORDINGS NELLAND	0 45	•	•	•	49	4 1	to absorred release. This score reflects suidance
	If Cheerval Belooms for	a Alvan a Volus	of 45	, Francisco	to Line			from page 29 MMS Moore Hurkall (SPA 1994)
	If Observed Belease 1	e Elvan a Velus	ef E,	Present	to Line	8		
2	NEUTE CHARACTERISTICS		_				4 2	
	A facility slape and Intervening Terrain	0123	3	•	3	3		Facility stops 218 (8 side); intervening terroin 165.
	8 1 yr 26 hr. teinfell	0123	-	1	1	3		24 hr reinfell 1 2 in. (Fig. 8, 40079300 App. A).
	C. Sistence to Starest Surface Voter	.125	1		•	•		Venue Creek shout 48 ft. easy.
	9 Physical State	0123	3	1	3	3		Assume some amplit amounts of liquid organic chatfesis
	TOTAL ROUTE CHA	AACTERISTICS SO	=		13	15		
1	CONTAINMENT	4183	•	1	•	3		Lordfitt has advante over; conteinment pard an
	wert CHARTETISTICS							Manual French. This cours of zero give a surface water raise poors of zero at cosp of therefore, the rest of
•	Chapter							this short is not moved. This same reflects
	A. Terisity/Persistance		_		•	16		seldence from seen 34 600 there Reveal (SPA 1104).
		012343		j	i	•		
		678		•	·	•		
	tedisastive							
		0 1 3 7 11 15 21 <b>26</b>		1	•	-		
	•• •• • • • • • • • • • • • • • • • • •	0 1 3 7 11 19 21 26	•	1	•	*		
	TOTAL WASTE CHAR		_					
	IOING BEST CHARL		_			*		
		Las I GASTI	-			=		
	TARRETS		-		•	_	4.3	
•	A Surface Motor Use	.125	•	3	•	•	•	
	8. Distance to Bereitive		=	\$	•	•		
	C Penulation Servati		-	1	•	44		
	Plateres to Water	12 14 15 20	_	•		-		
	Intake Peurstress	***	•					
	TOTAL TARRETS S		•		•	**		
4	CHOLATICO				-			
•	If Line I is 4. But	1sty 1 = 4 = 3				44300		
	If Line 1 is 6, mit		. 3					
	•		CHIEFE		•			
			-	METTIVE	•			
1	HOWALLISATION							
	Sivide Line 6 by 64388	and factifity by	100					
		-		r .	• •	100.60	1	MITE: All assess test frontested.
				4 tm •	•			
			نكانا لاعت	-		75.5		

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F

ALE ROLITE WORK SHEET Sites Original Landfill VALUE ML MATI MAR MEF. VAL PLICE SCOME SCOME SEC ----1 COMMENTE MELEANE • 1 0 45 5 1 to observed air release; therefore, antire air reute • 45 Bett and Leastfant score is sere. This score reflects guidance free page Sambling Protects: 39 HRS Users Republ (GPA 1984). If Line 1 is 0, the to . 8 Enter on Line 5 If Line 1 is 45, Then Present to Line 2. 2 WASTE CHARACTERISTICS 5 2 Sheet and A. Bestivity and 4121 1 Incompatibility testelly • C Reserving timete 812345 **Curtity** 678 Restourtive 0 2 3 0 12 16 20m2 1 TOTAL WASTE CHARACTERISTICS SCORE CHEM CAL MOTOMETINE 3 TABOUTS A. Population Within 8 9 12 19 18 18 4 Mile Sedius 21 24 27 30 8. 91stares to Seral. 8 1 2 3 tive invirument E Land Use 0123 TOTAL TANGETS SCENE 4 CALGALATICS Bultinly 1 g 2 g 3 CHEMICAL . 3100 SALLANDI ONS 0 35100 5 MARKEL 1 ZAT 100 Sivido Line 4 by 35160 and Multiply by 160 MITE: ME more for Evolunted. \$40104CTIVE to - # 80 100 00 100,170,07 to - 0.00 100.00 ****** ***** **** *** **** *** SHOULD CALBRATION OF TOTAL MICHATION SCHOOL CHEMICAL MAIGNETING * * 7 91 tranduter texts terfese teter teams . . 1.0 . 6.60 Ale Sees 47.8 42.40 he of Squares Square Stat of Sale 26.00 7.91 ...... 15.65 4,57 Source Goot of San Miridael by 1 73 TOTAL MIGRATION SCHOOL 

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*p-

CARREST PATTE THE THE STATE OF 
**(2)** 

. -

BIRECT CONTACT VORESMEET Site: 'Original Landfill

	SATING FACTOR	MALAR		MATI- PLIER	10000	1442. 16334		METERMINES FOR SACE ASSIGNED SCORE
1	COCCENS INCIDENT	45		1	-	45	8 1	to discread incident of personnel contemporaries or injury.
	If Charred Insident If Charred Insident	is given a secre	or 17	Present	to Line	2		a,,.
						_		Semarity purely covered landfill.
\$	<b>ACCESSIBILITY</b>	0123	1	1	1	3	-	
3	CONTAINMENT	0 15		1	•	15	4.3	Covered Landfill This seem of sero gives a direct
								correct scare of sore at step of therefore the rest of this shoot is not search. This coare reflects guidance
4	WHETE CHARACTERISTICS							from pages 57 to 60 mid toors Heracl (SPA 1984)
	Chaminal Taxielty	0123	•	5	•	15	8.4	
	tadioastivo	.1246		1	•	15		
	ran emerica	9 12 19	_					
_								
7.	, TARGETS A Pagulation Vishin s		•	4	•	*	8.5	
	1 Mile Resilus	•	_	4	•	12		
	8 Biotompo to 8 Critical Mabitat	0183		•	•	••		
	G 111001					-		
	TOTAL TABLETS	1000			•	-		
•	CALERATION							
	if Line 1 to 45, No If Line 1 to 0, No	Atiply 1 z 4 z 9						
	IF LIND 1 18 W, IN	ACIDA C	-	I CAL	•	21400		
			1401	ONET IVE	•	21466		
•	1001MA 12AT100							
•	Divide Line 6 by 2166					100 8		until: at many fat frequents.
		-		L No		100	-	
				# 14s ·	• =	100 0	•	

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Reschy Flate Plant CEARP Phase 1 DRAFT April 1986

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### FIRE AND EXPLOSION MORESHEET Site: Original Landfill

	VALU		<b></b>	MATI		MAX	our .
RATING FACTOR	CANE	_		PL ICE	score	SCORE	
1 DESERVED MELEAGE	•	3	•	<b>t</b>	•	3	7 1 to patential, therefore, antire score is zero. This score reflects guidance from page 47 MtS Users Harus!
2 WASTE CHARACTERISTICS							7 2 (SPA 1984)
A Struct Evidence	• 1	•		t	•	1	
8 ignitability	. 123	•		•	•	3	
C Resetivity	.128	•	r e	1	•	3	
8 Incompetablity	. 1 2 3	1		•	•	3	
1 Mote Quentity							
Chapterl	. 121		-	1	•		
	3478	•	-	•	•	•	
Reglessive	. 1 2 3	***		1	•	•	
TOTAL WASTE		-	_				
1012 0016	-	CHECK			•	*	
		END , MET	-		•	*	
		•					
3. TARGETS		•				_	73
A Sistance to Hearest	123	45		1	•	5	
Papelacton			_				
8 Plateres to Beards	1 2 3	(		1	•	3	
<b>Sullding</b>			_	1	•	3	
C. Distance to Saroi-	.183	,		•	•	•	
tive Govinerant	.123			1	•	3	
9 Land Use 5 Passistion Vishin	6123		=	i	ě	j	
2 mile testus	• • • •	•	_		-		
F Buildings Within	. 1 2 3	45		1	•	•	
2 mile Andius							
						24	
TOTAL TARGET	-				•	•	
4 CALGRAPION							
multiply 1 x 2 x 3					_		
				HEAL		1448	
				METIVE	•	1440	
5 #60004.1247100							
Bivide Line 4 by 144	and Reft	iply by 1					
		(24)	Mi G	M 9fe •	•	100 8	
				il ste .	1.00	100 0	_
		100	at in	# H+ =	• •	100 #	•

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Rocky Fints Pinet CEARP Phase 1 DRAFT April 1866

#### MAZARE RANKING TYSTEN/NURSIFIED NAZARE RANKING SYSTEM (MOLVEMES)

#### MINISTER SHOWER COVER SHEET

117E MARE: Co	oling Touar Standaum Pends
FIELD OFFICE: No.	sity Flats Plant
(PA NGQIGH: VI	
PERSON(8) IS COUNTY	* ** * * * * * * * * * * * * * * * * * *
WE OF SEVIENCE: Ea	Recinct International, Operator  Recinct International, Operator  Recinct International Internationa
-	THE FACILITY:
	l, surface immunitarit, pile, centeliery types of heserdad minimum; lesetion of the facility; major consumy types of information readed for rating; aganny union, etc.)
	purdunts used for the centsfraunt of bloodnes from
	secured that these improvements were bestfilled uithout
removel of the residues	). One pand executed about 30x100 ft , the other two
manufact about Ma75 fo	

scangs:		contest.	Melevetive	***
	•	12.41	• •	12.41
	tge •	21.46	• •	21 46
	ter •	• #	• •	9.00
	\$0.0	0.00	0.00	1.00
	5fe =	0.00	•.	0.00
	140 *		4.00	0.00

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Resely Flats Plant CEARP Phase 1 DRAFT April 1984

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#### CARLINGVATER SOUTE VORICEMENT Site: Cooking forcer Standard Porch

		WALUE	<b>MIL</b>	MATI		MJ.	W)	
	BATING FACTOR	RANGE	VAL	PLIEB	SCORE	score	SIC METERMENTS FOR EACH ASSISSED SCORE	
	GROCENED MILEARE	4 45		,		45	• • • • • • • • • • • • • • • • • • • •	
•	If theretal telesse		-	•	•		3.1 to observed release. This seems reflects guidance	
	If Charrest Botome 1						from page 9 MS Upers Market (EPA 1984)	
	11 (1994) 440 44(1994)		w v,	-	CO CING	•		
1	MOUTE CHARACTERISTICS						3.2	
	A Paper to Aquifor of	0123	3	5	•	•	Peach to shellow aguifar 18 30 ft , variou preservati	(v
	Common						(Mer 1976)	
	8 Not Procipitation	. 1 2 2	•	1	•	3	Procipitation to In. (Fig. 5, MCP0500 App. A);	
	C Permanality of the	0123	3	1	3	3	Lake Evaporation 42 in. (Fig. 4, 40C/R300 App. A)	
	Unosturated Zone		_		_	_	aighty personale (ther 1976).	
	Physical State	0123	3	1	3	3	Liquid blandous and residue from Lithius destruction	-
	****						This searing reflects guidance from pages 7 to 16 uni	10
	TOTAL MEDITE CI	MAACTERISTIES B			12	1\$	Users Reveal (SM 1996).	
3	CONTATIONAL	0123	3	1	3	3	3 3 Covered eres; no liner	
	-						34	
	Chast sol							
	A facialty/Persistence				18	18	Chromotoms Tamiestry 3; persistence 3 (See).	
	S. Recording Vento	012343	1	1	1	•		
	<b>Countity</b>	678					Assumed volume loss than 40 drums. This score reflet guidance from page 19 MMS Users Hersel (SPA 1986).	<b>#76</b>
	Redissative		_	_	_			
	A. Recient Coornel	0 1 3 7 11 15		1	•	*	insufficient data to coloutate marinum chaorved mits	3
		21 26		_	_	••	****	
	8 Maximum Potential	0 1 3 7 11 15	-	1	•	*	Insufficient date to estautate maximus petential mate	18
							•	
	TOTAL WASTE CH	-	3400					
		CHEFF	ICAL		19	*		
		MOIONE	rive		•	*		
•	TARGETS						35	
	A Sroughbotor too	.123	_	3	•	•	Assumed use for drinking upper with elternate source	,
	S Sistance to Tourest		12	1	12	4	evellable. Pistance to recreat well 1 to 2 miles	
	tell/Papeletter	12 16 10 20					Mout 90 rural walls within 3 alias; papulation serve	-
	Served	***					enoused at 190 (3 8 people per vall). This searing	
							reflects guidance from pages 36 to 27 MR Voors Hence	<b>p</b> t
	TOTAL TANCETS	1000			•	49	(BA 1966).	
<b>6.</b>	CALGRATICS							
	If Line 1 to 46, That		_ •					
	If Line 1 is G, Rut	AMMAST ST			12912	1730		
			CHOICE		14316	1730		
,	MANUAL I 2011/05				•			
••	Divido Line 6 by 57390	and Saletale b	100					
				100 e	21 40	100.00	D ANTE AN AMOUNT THE EVOLUTION.	
		MO	CAST IVE	100 *	• •	100		
			MIN	100	21.4	100.00	•	

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#### SUPPLIES WATER MOUTE WERKSHEET Sites Cooking Tower Standard Parket

		W	N.UE		ALTI		MAX	**	
	MATING FACTOR	**		WAL	代禮	SCORE.	scent	<b>M</b> C	METERCES FOR EAST ASSIGNED SCORE
1	COOSEVED WELEARE	•	45	Ċ		•	-	4 1	to abserved release. This score reflects guidance
	If Charried Belooms !								from page 27 till Veers Heruel (874 1984)
	If Cheervad Release !	s Sive	n a Value	of 0,	Prese	ed to Line	. 2		
2	ROUTE CHARACTERISTICS							4 2	
	A, facility Stopp and	• 1 :	2 3		1	•	3		Facility slape < Tily Intervening terrain < Til (Nep
	intervening terrain						_		mp 19901 40, 1986).
	8 1 yr. 36 hr Golnfell			1	1 1	1	3		St he reinfelt 1 % in. (Fig. 8, 48270300 App. A) Thereb United Greek about 2000 fc. may.
	C. Distance to Storest	0 1 3	3 3	•		•	•		20 M/42 24M 4M 41. 4M.
	Surface Voter S. Physical State	• 1 2	2 3	1	1	3	3		Liquid blooken and resident from Lithium destruction
	9. Mys. 100 - 100-	• • •	• •			-			(Ban 1973).
	HALT WORLD CON	MITTE	197105 94			•	15		
3	CONTAINMENT	. 1	2 3		1	•	3	4 3	Covered erest to liner; sentainment pand on
									Walnut Great This score of zero gives a surface
	WATE CHARGETERISTICS							4 4	water rate core of sore at atop of therefore, the
	Chaptest		<b>-</b>				-		rept of this short is not secret. This secre reflects suidance from page 36 MM Vecre Herest (SPA 1984).
	A Testel ty/Persistence				1		4		Bridge the last to me one water (an man):
	3 Household Wolfe	. 1 2	, . ,		•	•	•		
	<b>Descrity</b>	478							
	Radiosstive			_			_		
	A. Marina Garret	9 1 3 21 26	7 11 19	•	1	•	-		
	S. Resines Potential		7 11 15		1	•	*		
		21 26							
	TOTAL WASTE CM		*****	_					
	JAINT ANGLE COL					•	*		
			EAR I BAST			•	*		
	TARGETS							4 5	}
•	A Surface Victor Use	. 1	2 3	116	3	•	•		
	8 Sistance to Sansitiv	1	23		2	•	•		
	<b>Environment</b>					_			
	C Population Served/	•	4 8 10		1	•	-		
	Sistemes to Motor		16 18 25						
	Intube Secretross		<b>n n n</b>	•			=		
	TOTAL TABLETS					•	~		
•	CALGRATION						4		
	If Line 1 to 46, Rei If Line 1 to 6, Rei	sipie :	 2 . 3 = 4	. 5					
	14 (100 4 10 0)		• • • • •		HOL	•			
				401	ener IVE	•			
,	7 1001141.1341160								
	Sivide Line & by MAN	-	bitiply b	y 166					mile: Il ampe tot Evoluntes.
					hr pm		100 00		
			***		W 100 1		10.0		
				76.27	<b></b>	• •••		,	

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Rocky Plate Plant CEARP Place 1 DRAFT April 1906

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12 100

. 30

		A	a noute von	<b>E 346E</b> 7		\$1 te:	Cooling Your Blaudaus Ponds
		VALUE		MATI		MAX	MF
	MATING FACTOR	ture:	WAL	PL IME	90000	100M	MEC REPRESENTATIONS SACTIONAL SECOND
1	COMENUE RELEASE  Sale and Lacetime  Sampling Protects  If Line 1 is 8, the  If Line 1 is 45, The	So = 0 Enter	on Line S	1	•	45	5 1 to observed air release; therefore, entire air route seare in zero. This seare reflects guidance from page 30 MRS Usero Rumani (GPA 1981).
	WATE CHARCTERISTICS						5.2
	A. Beastivity and incorporibility	0123		1	•	3	
	0. Testotty	.123	•	1	•	•	
	C Hoserdous Moste Quartity	678		1	•	•	
	fadicactive	0 2 5 8 12	16 3000	1	•	*	
	TOTAL WASTE CO	MAACTER I ST IC	3 9089				
		_	ASIM		•	*	
_	*******	LOI	CACT IVE		•	**	
3	TABLETS					-	
	A. Population Within 4 Mile Series	0 9 12 15 1 21 24 27 30	-	1	•	30	
	9. Distance to Sarai-	0123		\$	•	•	
	C Land Use	4123		1	•	3	
	TUTAL TARGETS	1COM2			•	*	
4	CALGALATICO						
•	Pultiply 1 = 2 = 3						
			CHENT	<b></b>	•	33100	
			100	ETIVE	•	35100	
3	HOWAL I ZATION						
	Sivide Line 4 by 3516	M and Multip					
						100 00	WITT: WE desire for Evoluated.
			MOIMET!			100 00 100 00	
							****** ***** *** **
		-				10000	
				-	MENICAL (		
	transactor toxto	( <b>Tgu</b> )			21 48	• •	
	Surface Voter Basto	(Sau)				9.00	
	Air Outo	(90)			• •	• •	
	he of Squres				41.30	0.00	
	Square float of Ball				21 48	•.₩	
-		-		•	12.41	4.00	Source host of the Sivided by 1 73

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Booky Flate Plant CEARP Phase 1 DRAFT April 1986

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DIRECT CONTACT MORESHEET Sites Cooling Tower Stauthum Pends

	SATURE PACTOR	VALUE RANGE	SEL MA. VAL PLI		MJ. SCORE	MEF. MEC. REPRESENTE FOR EACH ASSISTMENTS SCORE
١.	COSCEVED INCIDENT 17 Charved Incident 17 Charved Incident	8 45 to Atvan a Seero to Atvan e Seero	ef 45, Pr	seed to Lin	•	8 1 to ensures incident of parametric contention or injury.
	ACCESSIOILITY	.123	1 1	1	3	8 2 Security guard; covered.
-	CONTAINMENT	• 15	• 1	•	15	8 3 Pends severed. This seems of tone gives a direct contact seems of sero at step by therefore, the root of this shoot is not segmed. This seems reflects
4	MARIE CHAMETERISTICS					guidance from pages ST to 46 Mile Upper Harupt (SPA
	Chamical Taxielty	. 1 2 2	<b>4</b> !	•	15	Q.4 1984).
	Radiosative	6 1 2 4 4 9 12 15	₩ '	•	15	
3	TABLETS A. Population Within a	0123.3	=		*	••
	8. Distance to a Critical Madrical	0123	4	•	12	
	TOTAL TARGETS	1000		•	*	
4	CALGRATION  If Line 1 is 49, the  If Line 1 is 6, the	delpty 1 x 4 x 5 delpty 2 x 5 x 4	e 5 CHIMICAL RADIGAET		214 <b>00</b> 214 <b>00</b>	
,	, magamilization Bivide Line 6 by 2166	CH 248 16			100 (	8 1975: 18 mare tot Evolusted. 8

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Rocky Finte Plant CEARP Phase 1 DRAFT April 1986

**19**'

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## FIRE AND EXPLOSION VENEZURET Site: Cooling Tower Blowson Pends

			ua.	LUE						
	BATTING FACTOR					L MATI	1000			METTREMENT FOR EACH ALCIGNMEN SCHOOL
				_				-		
1	COSCERVED MELEASE	1		1	3	• 1	•	5		potential; therefore, the entire score is zone its score reflects guidance free page 49 mit years
2	WASTE CHARACTERISTICS									Part (674 1164)
	A Birect Evidence	•	3			1	•	3		
	T ignituality	• 1	3 3		=	1	•	3		
	C Beastivity	• 1	<b>2</b> 3		10	1	•	3		
	8 Incompatibility	• 1	3 3		-	1	•	3		
	E. Weste Guartity									
	Chaptest	. 1	2 3	4	•	1	•			
		5 6	7 8							
	Redissative	• 1	2 3	7 6 8	•	1	•	•		
	TOTAL WASTE O	34446	TEN	ınıa	-					
				a	IN CAL		•	*		
				MI	METIVE		•	**		
3.	TARGETS								73	
	A. Distance to Bearest	. 1	2 3	4 5		1	•	5		
	Population									
	B. Distance to Secret	8.1	2 3			1	•	3		
	<b>Dullding</b>									
	C. Distance to Sarai-	. 1	<b>2</b> 3			1	•	3		
	tive <b>Environment</b>									
	9 Land Use	• 1	1 2		-	1	•	3		
	1 Population Within	• 1	1 2	4 5	100	1	•	5		
	2 Mile Medius							_		
	F Buildings Within	• 1	3 3	4 5		1	•	,		
	2 Mile Radius									
	TOTAL TABGETS	-	•				•	*		
4	EALGRAFICE									
	meltiply 1 x 2 x 3							_		
						II CAL	•	1440		
					RAG (	enet ive	•	1448		
5.	PROPERTY IS NOT THE PROPERTY IN THE PROPERTY I									
	Sivide Line 4 by 1448	<b></b>	M t		-					
						L 9fe =	• •	100 00		FF: HE mare tot Evolustes.
				w		A sto .		100.00		
					MINIS	# 1fe e		168.88	1	

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Rocky Flate Plant CEARP Phase 1 DRAFT April 1986

### MAZARO MARKING SYSTEM/HODIFICO HAZARO GARCING SYSTEM (HRS/HHRS)

SITE MANEL	Off Studge Stapage	ı	
fills stricts	Restly Floto Plant	••	
Da secisii			
P9290H(8) 1W C	MAGE OF SITE: Pla	Int Heneger	
		• • • •	
	•	•••	
AND OF REVISABLE	Kan fee/Marji Marti		T: April 1986
	of anjer corosing t infantoly 20 a 50 ft	types of infere	** *** * * * * * **** * * * * * * * * *
		• • • •	<del>-</del>
		•	· · · · · · · ·
• ••••	•• •• •••••	••	
		•••	
scenes:	CHEFTER.	NO IGNETIVE	Part I Part
•	9.15	9.00	9.15
1gs + 2as + 1a +	19 82 0 80 0.00	• •	19 40 0 40 0.00
260 0	0.00		

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Rocky Plate Plant CEARP Phase 1 DRAFT April 1986

#### SECUREMENTER SOUTE MORCHHEET Site: Of Studen Discount

	SATING FACTOR	VALUE	_	L =			***	407	
		-	•	<b>L</b> P	r i (m	<b>ICOM</b>	<b>SCORE</b>	<b>SEC</b>	REPENDICES FOR SACE ASSIGNED SCORE
1	COPERNO RELEASE	•	45	•	1	•	45	3 1	No abserved retemms. This score reflects guidence
	If Minervad Belease	le siven e s	ears of (	15. P	record	to Line	4	•	from page 9 MBS warra Harval (SPA 1984).
	If Charved Release								
_									
7	MOUTE CHARACTERISTICS							3 5	
	A. Septh to Aquifor of	. 1 2 3		3	2	•	•		Septh to shellow againer 10 20 ft , variou sessorally
	8. Not Presiditation	. 123				_	_		(mer 1976).
	C. Personability of the			•	1	•	3		Precipitation 10 in. (Fig. 5, 40CPA300 App. A);
	Grantureted Janu	• • • •		•	•	•	3		Lake Evaporation 42 In. (Fig. 4, 40078300 App. A)
	D. Physical State	0123		1	•	,	3		Highly paramete (Berr 1976). Liquid oil sluge of time of dispessi. This seering
		• • • •		•	•	•	•		reflects guidance from pages 9 to 16 MRS Veers Herest
	TOTAL ROUTE CI	WAACTER I ST !	CA 100Mg			12	15		(SPA 1984).
1	CONTAINMENT	. 1 . 3		3	1	3	5	3 3	Covered pit, no liner.
•	WASTE CHALCTERISTICS							3 4	
	Chattlesi								
	A Topicity/Persistmen		16 16	12	1	12	18		Assert on characteristics of the country of
	B. Recording Mosts	. 1 2 3 4 1		_	;	2			Petroleum characteristics (Table 4, 40071308 App. 4) Tanieity 3; pereintenan 1 Appared volume 30 to 50
	Suntity	478	•	•	•	•	•		drum (Bran 1973). This scaring reflects guidance from
		•••							page 19 MR Union Revent (SPs 1984).
	Redissative								
	A. ROEIMAN Cheerved	0 1 3 7 11	15 🖷		1	•	*		
		21 26							
	3. Hazima Potential	0 1 3 7 11	15 🖷		1	•	*		
		21 <b>26</b>							
	TOTAL WASTE CO	4040001071							
	IAIN BELL PE					16	*		
		-	MIT IVE			•	=		
3	TARGETS					-	_	3 5	
-	A Groundwater Use	. 123		2	3	•	•		Assumed use for drinking upper with attempts source
	8 Sistemes to Hourest	. 4 6 6 10		12	1	12	4		eveliable. Pletares to restreet well 1 to 2 miles
	Holl/Population	12 16 18 20	)						About 50 rural valle within 3 oiles; population serves
	terved	***	40						annualed at 199 (3 & people per wall). This searing
									reflects guidanus fraz pagas 26 to 27 MRS Voors Marupl
	TOTAL TABOUTS	som(				16	**		(GPA 1984).
•	CALGRATIC		_						
	If Line 1 is 46, Red								
	If Line 1 is 6, Mak	zakt ( 1 )		HEE.			177		
				MER.			1720		
,	MARKET LANGE		-			•			
••	Divide Line 6 by 57300	and the clas	y to 100						
			M. 9		w #	140.00		MITE: 15 mars his frotuntes.	
			MOIONET	W 3		• •	₩ #		
			MAKE		•	15.00	100.00		

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Rocky Flate Plant CEARP Phase 1 DRAFT April 1904

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agentering /

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### MATACE WATER BOUTE VERNENEET Sites Of Stumpe Sispensi

		ANTINE	*		TI	MAX.	4	
	RATEMS FACTOR	RANGE		4 PLI		90000	100	REPERBUCES FOR EACH ASSISSED SCORE
1	CREETYED TELEVASE	•	45	. 1	•	65	61	to abserved release. This score reflects guidance
	If Charry delease	e fiver e	-	45, Pr	ecoud to Li	m 4		from page 27 till Users Hartot (SPA 1984).
	If Cheerval Selecte 1							
2							4 2	
	A facility Slape and	. 1 2 3		2 1	1	3		facility slape + 30; intervening terroin + 86.
	intervening Terreir					_		
	8 1 yr 26 hr Roinfell			1 1				26 hr reinfell 1 2 in. (Fig. 8, 48678300 App. A)
	C Bistance to Bearest	.153		3 5	•	•		After their diest and ac-
	Surface Water  Provided State	.123		1 1	1	3		Ligard of t studes of time of disputed
	A Label and Renea	• • • •		•	•	•		
	TOTAL BOUTE CH	MACTER 1971	C) 1000E		11	15		
3	CONTAI INDIST	. 1 2 3		• 1	•	3	4 3	Covered pit; containment pand on Vision Creek This
								score of sore gives a surface water rests score of sore at atop & sharefure, the rest of this sheet is
•	WATE CHARETERISTICS						•.•	not secret. This score reflects guidance from page 14
	Chaptent A Textel ty/Perelistatus		٠	,		18		WE Users Hanal (SPA 1984).
	A Textelly/Persistence	01234			-			
	Quantity.	678						
	Red cost (vo							
	A. Hains Corvel	01371 2126	1 15	1	•	<b>*</b>		
	S. Parima Petential	01371	1 15 🚾	1	•	<b>×</b>		
		21 🗯						
	TOTAL WASTE CIM	AACTUR 1871	CR 900FE					
			CHIMI CAL		!			
		w	IONETINE		,	. *	4 5	
5	PTIPRAT						• •	•
	A Surface Veter Use	0123	_	1				
	8 Sistense to Sensitiv	• • • • • •		•		•		
	C. Pundation Served		10 =	1 1		. 40		
	Sistems to Voter	12 16 1						
	Intelle Persotrate	* * *						
	TOTAL TARGETS	-			1	. *		
•	CALGRATICE							
	If Line 1 is 45, the	telpty 1 a	4 # 3			44394	,	
	If Line 1 is 0, Ma	felby S =						
				gried, o ienel		•		
			•		170	-		
1	r, ugava, ization		alv <b>-</b> 4					
	Divide Line 6 by 4430			HOM. S	w	9 100 00		apper all some for frotunes.
			MOISM			100.00	)	
				-		8 160.00	)	

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Backy Flots Plant CEARP Phase 1 DRAFT April 1906

THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PERSON NAMED IN THE PE

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ALS SOUTE WINE SHEET Site: Oil Sludge Pissuel MIL MATI MI. MI. MATING PACTOR WAL PLIER SCORE SCORE SEC REPRESENTED FOR EACH ADDITIONS SCORE 1 CONTINUE MILEANE 8 45 5.1 to attenued air release; therefore, entire air route 45 Bets and Lecetions score is sore. This score reflects guidance from page Sampling Proteools 39 MHS Users Maruel (MPA 1984). If Line 1 is 0, the to . 0 Enter on Line 5 If Line 1 is 45, Then Present to Line 2. 2 WASTE CHARACTERISTICS 1 2 Charal and A Beautivity and . 1 2 3 1 Insuspectablity S. Testelty . 1 2 3 .12345 Quest I ty 678 tedicastive. 0 2 5 0 12 16 20mg TOTAL WASTE CHARACTERISTICS SCORE : 441CM MAD I GNET I VE A. Population Visite 8 9 12 15 18 18 4 Mile Bedius 21 34 27 30 8. Distance to Serei- 0 1 2 3 tive Swiresant C. Land Vac .123 TOTAL TARGETS SCHOOL 4 CALCALITIES Politiply 1 x 2 x 3 8 35100 CHEST CAL BYITMEIGH 5 HOMEN (2AT100 Divide Line 4 by 35100 and Rutefuly by 100 METE: ME more not (volunted. MAZIMAN 60 - 8 80 100.00 .. ...... ...... ..... SANGET CALGRAFICE OF TOTAL REGISTION COME CHEMICAL MOTORETING 15 # . . Crandater Sade 1 00 • • . ... . . Afr Smale he of there 290 40 1.00 tears test of he 15.48 1.00 .. ... ... ..... 7.10 0.00 Square fact of the Sivided by 1 73 -

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Blocky Flate Plant CEARP Phase 1 DRAFT April 1906

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DIRECT CONTACT WORKSHOET Site: Oil Studge Dispused

	BATTING FACTOR	VALUE	SEL MATE WL PLIM	SCORE	ICEME ICEME	
1	coccaville inclined?  11 Cheerval Inclident 11 Cheerval Inclident		Ø 1 of 45, Present			8 1 to observed incident of personnel contemination or injury
2	ACCESSIBILITY	0123	1 1	1	3	8 2 Security quarty several pit
-	CONTACHUMENT	e 15	• 1	•	15	8.3 Covered pit. This score of core gives a direct contact score of sore at step 4; therefore, the rest of this
4	WASTE CHARACTERISTICS					phone to not mored. This stere reflects guidance from pages SP to 40 MB Voore Manual (SPA 1986)
	Chaminol Tanielly	8125	<b>100</b> 3	•	15	8.4
	Redicately0	9 12 15	<b>46</b> 1	•	15	
5	TANGETS				_	8.3
	A Population Within a 1 Hito Sadius	412343	4	•	_	4.3
	8, Bistores to a Critical Hebitat	•123	4	•	18	,
	TOTAL TABOUTS	10010		•	×	
٠	CALGREATION  If Line 1 to 45, Ref.  If Line 1 to 0, Ref.					
			CHRICAL MARIEMETIVE	-	21666 21666	
7	HORMA IZATION	a and makelmin by	100			
	Sivide Line 6 by 21666		CHICAL NO -	• •	100 00	MITE: All more let Evoluntes.
			MET 1VE -		100 10	
					100,00	

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Rocky Flats Plant CEARP Phase 1 DRAFT April 1906

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"如""高"""作为的"。

A 100 To 10

#### FIRE AND EXPLOSION MERCEMBET Sites Of Studge Dispusses

			VALUE		mit.	MATT		MAIL	MF	
	BATTER FACTOR			B	WAL	PL I SE	SCORE	scond	100	REFUNDACES FOR EACH ASSIGNED SCORE
,	CONTANTO RELEASE	1		3			•	3	71	ocential; therefore, entire score is zore. This
•		•		•	•	, ,	•	•		e reflects guidance from page 49 MRS Veces Named
ŧ	WATE CHARGETERISTICS								7 2 (EPA	1986).
	A Direct Syldamo	•	-			1	•	3		
	8 Ignitability	• 1				1	•	3		
	C feestivity	• 1	-		•	1	•	3		
	0 Incorporability	• 1	5 2			1	•	3		
	E Mate Gantity									
	Chapteol	. 1	2 3 4			1				
		3 6				•	•	•		
	Radiostive	• 1	233	• •		1	•	•		
	TOTAL WASTE O	_	****		****					
	101-22 112-16 1			CHES			•	-		
				e larc			i			
3	TAMETS								73	
	A. Sisteres to tearest	• 1	<b>3 3 4</b>	5		1	•	3		
	<b>Population</b>							_		
	S. Sistance to Bearest	• 1	1 2			1	•	3		
	bullding				_					
	** ************************************	• 1	2 )			•	•	3		
	tive Environment 9. Land No	• 1	• •		•	1	•	3		
	I franciscion Vision	-	 2 3 4		=	į		•		
	2 si le Redius	• •	• • •	•	_	•	•	•		
	F Building Vishin	• 1	234	3		1	•	5		
	2 Wile Redive									
	TUTAL TARGETS	1000					•	*		
	CALGRATICE									
•	Reitiply 1 s 2 s 3									
					CHEM	CAL	•	1446		
					Mil	METIVE	•	1448		
	WEST AL 1247100									
•	Sivide Line 4 by 1446	-	M e fa		160					
	4a. 4 al 1444					. Sto =	• •	100 00	-	t M mare for Evolusted.
				-		8fe *	1.90	109.00	)	
						000 E	0.00	100.00	1	

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Backy Flats Plant CEARP Phase 1 DRAPT April 1986

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### HAZARD BANKING SYSTEM/HEBIFIED NAZARD BANKING SYSTEM (HES/HORS)

#### HEE/FORS SUBMET COVER SHEET

SITE MARE: Lithium Motol Destruction Site

FIELD OFFICE: Booky Flats Plant

****

by delan Alli

PERSON(S) IS CHARGE OF SITE: SOE, CAPOR

Residual Litternet Laret, Charater

-

HAVE OF REVIEWER: East Bos/Parill Harts, LASL MATE: April 1986

#### MEMBAL MEMBERTIME OF THE PACILITYS

(for example: landfill, surface impossions, pile container; types of hecardina macroscopy leastles of the facility; contained in route of asjer contains types of information receive for retings against sets.)

Two small covered pite upod for the destruction of lithius estal

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SCORES:		CHAMICAL	MOTENETIVE	WEITH.
	<b>to •</b>	7.70	9.00	17
	5gu •	13 47	0.00	15 47
	<b>100</b> •	9.00		• **
	<b>54 •</b>	9.00	1 10	• •
	8fe #	1.40	• •	• •
	***	1.00	• •	• •

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### GROUNDIANTER SOUTE MOMERMET Sites Lithium Hotel Sentruction Site

Comparing National					961	-	MATI MISS		****	977 886.	ALTHOUGH FOR EACH ADDITIONS SOURCE
17 Character Solicione (s of time is better of 55, Processed to Line 6   17 Character Solicione (s of time is better of 5, Processed to Line 2   2 Start Constant (start is divers in better of 5, Processed to Line 2   3 Start Constant (start is divers in better of 5 1 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	4AT   185 745		•		•	•	•				•
17 Conserved Sectional 1   1 clear to Section 2   1 clear to Section 2   2 clear	1 CONSTANTO MELE	466	•			•	•	-			
2 MOUTE COMMANTERISTICS  A both to hapfor of 0.123	If Observed	Release to	\$1 van	1 100	·	• ·	Process t	e rise s	ì		
### Supply to April 19 12 3 3 2 6 6 Conserved    Description   Descripti	I/ 100 100		•••••	-		•		• • • • •			
Supplementary											
2   Set Principitation   0   2   2   3   3   3   3   3   3   3   3		exiter of t	. 12	3		3	2	•	•		
Commanditive of the 0 1 2 3						•	1		3		
### D. Proposed State  1			-			ĭ	i	3	3		Lake Evaporation 42 In. (Fig. 4, 40070300 Asp. A)
TOTAL MATTE CHARACTERISTICS SORRS  11 15 1983.  3. CONTAINERT 0 1 2 3 3 1 3 3 3 3 Covered piles no liner.  4. Lightup contaction 3 4 9 12 15 16 12 1 12 18 12 1 1 1 1 1 1 1 1 1 1 1 1 1		-		_					_		Highly particular (Bury 1976).
17   19   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985   1985	3. Myalaal S	tato	. 12	3		1	1	3	3		Pender or 11re apprilet. This appring restarts
3. CONTAINENT 0 1 2 3 3 1 3 3 3 3 Covered pine; no liner,  4. Unity Contact Content of 1 2 3 5 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1								••	16		
A   MARTE CAMACTERISTICS	TOTA	L MEATINE CHA						••			
Complete	3. CONTAINMENT		. 1 2	3		1	1	3	3	3 3	Covered pites no liner.
Chapters  A Tailetty/Persistance 0 3 6 9 12 19 16 12 9 12 18  Endicative Marks 0 1 2 5 6 3 1 1 1 9 8 10 1 1 9 8 10 1 1 9 8 1 9 1 9 8 10 1 9 8 10 1 9 8 10 1 9 8 10 1 9 8 10 1 9 8 10 1 9 8 10 1 9 8 10 1 9 8 10 1 9 8 1 9 1 9 8 1 9 1 9 8 1 9 1 9 8 1 9 1 9											
A Transity/Persistence 0 3 6 9 12 19 18 12 1 12 18  5. Teachine teste 0 1 2 5 6 5 1 1 1 1 9  Assumed values less than 48 drule. This easer reflects guidance from page 19 also teach 48 drule. This easer reflects guidance from page 19 also teach 48 drule. This easer reflects guidance from page 19 also teach 48 drule.  A Residence Protected 0 1 3 7 11 15 als 1 0 26  21 26  FOTAL MATE CHMACTERISTICS some CHMICAL 13 26  B TAMETE  A Grandwater teach 0 1 2 5 2 3 6 9  B STANSTED  A Grandwater teach 0 1 2 5 2 3 6 9  B STANSTED  A Grandwater teach 0 1 2 5 12 12 40  B STANSTED  A Grandwater teach 0 1 2 10 18 30  B STANSTED  TOTAL TAMETE SOME  18 49  TOTAL TAMETE SOME  19 10 6 5, Religibly 2 x 3 x 6 x 9  CHMICALTINE  17 10 0 5, Religibly 2 x 3 x 6 x 9  CHMICALTINE  17 10 0 5, Religibly 2 x 3 x 6 x 9  CHMICALTINE  Divide Line 6 by 57300 and Religibly by 140  SANSTERS  B STANSTED  TOTAL TAMETE SOME  18 49  STANSTERS  STANSTERS  SANSTERS   4 WATE CHARGE	W197103								•••		
A Transity/Persistence 0 3 6 9 12 19 18 12 1 12 18  5. Teachine teste 0 1 2 5 6 5 1 1 1 1 9  Assumed values less than 48 drule. This easer reflects guidance from page 19 also teach 48 drule. This easer reflects guidance from page 19 also teach 48 drule. This easer reflects guidance from page 19 also teach 48 drule.  A Residence Protected 0 1 3 7 11 15 als 1 0 26  21 26  FOTAL MATE CHMACTERISTICS some CHMICAL 13 26  B TAMETE  A Grandwater teach 0 1 2 5 2 3 6 9  B STANSTED  A Grandwater teach 0 1 2 5 2 3 6 9  B STANSTED  A Grandwater teach 0 1 2 5 12 12 40  B STANSTED  A Grandwater teach 0 1 2 10 18 30  B STANSTED  TOTAL TAMETE SOME  18 49  TOTAL TAMETE SOME  19 10 6 5, Religibly 2 x 3 x 6 x 9  CHMICALTINE  17 10 0 5, Religibly 2 x 3 x 6 x 9  CHMICALTINE  17 10 0 5, Religibly 2 x 3 x 6 x 9  CHMICALTINE  Divide Line 6 by 57300 and Religibly by 140  SANSTERS  B STANSTED  TOTAL TAMETE SOME  18 49  STANSTERS  STANSTERS  SANSTERS   raminal.											
Assumed variety 6.7.8 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	A Totaleity/	haral exercis		<b>9 12 1</b>	15 16	12	-				Listing continues totaleity 2 (out), persistence 3.
Resilience from page 19 diff interes Repres (SNA 1961).			. 1 2	545		١	1	1	•		second values land than 48 drains. This state reflects
### Participation   ### Pa	Guant 1 th	•	474								evidence from page 19 mile tears murant (SFA 1984).
A. Resistant electrical 0 1 3 7 11 19 HE 1 0 26  B. Resistant Potential 0 1 3 7 11 19 HE 1 0 26  TOTAL Unite Committee sease	Barel according										
9. Reminus Potential 9 1 3 7 11 19 ME 1 9 36  TOTAL UNITE CHARACTRISTICS SOME CHIRICAL 13 35  AMORATIS 3.5  A Procedular Use 9 1 2 3 2 3 4 9 Assumed use for drinking under with elternate source 9 Sistema to Server 6 6 6 8 10 12 1 12 4 40 repliable. Distance to rearror unit 1 to 2 alice Well/Population 12 16 18 58 Server 26 20 32 38 40 repliable properties source TOTAL TAMOSTS SOME 18 40 1905.  TOTAL TAMOSTS SOME 18 40 1905.  TOTAL TAMOSTS SOME 18 5 2 5 2 5 2 7 200 No. 27 200 No.		borred	. 1 3	7 11 1	15 👊		1	•	*		
TOTAL MATE CHARACTERS SERIES  CHIRICAL  AMPLIANCE UNION			• •					_	•		
TOTAL UNDTE CHARACTERISTICS SOME  CHAPTER  ADDITION  ADDITION  ADDITION  A Groundator use 6 1 2 3 2 3 6 9  Billione to theories 6 6 6 10 12 1 12 40 position uses with alternate source  Billione to theories 6 6 6 10 12 1 12 40 position uses to resorter unit 1 to 2 after  Billione 1 12 16 18 30 position 12 16 18 30 position served  BOLL/Population 12 16 18 30 position 12 16 18 30 position are units. This seering reflects guidance from pages 36 to 27 300 theory found to 17 Line 1 is 45, that tiply 1 x 6 x 9  If Line 1 is 6, that tiply 2 x 5 x 6 x 5  CHERRICAL 7732 57330  ADDITIONALIZATION  BUILDALITY SOURCE 13.47 168 60 185.69  TYPE STATE SOURCE 13.47 168 60 185.69	t. Helma A	etert(al			15 -		'	•	-		
CHRISTIC ADDITION 0 26  3.5  TARRETS  A Grandator Use 0 1 2 3 2 3 4 9  Bittance to Recent 0 4 4 8 10 12 7 12 40 poplight. Distance to rearrant until 1 to 2 alice secured until 12 14 18 20 poplight. Distance to rearrant until 1 to 2 alice secured until 12 14 18 20 poplight. Distance to rearrant until 1 to 2 alice secured until 12 14 18 20 poplight. Distance to rearrant until 1 to 2 alice secured until 12 14 18 20 poplight until 12 14 20 poplight until 1			., -								
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APPENDIX C BIBLIOGRAPHY NOT FOR PUBLIC DISSEMINATION
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nuclear information subject to Section
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